COGNITIVE AND NON-COGNITIVE COLLEGE READINESS IN PARTICIPANTS IN THREE CONCURRENT ENROLLMENT PROGRAMS AT A NORTH CAROLINA COMMUNITY COLLEGE

A Dissertation

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ABSTRACT

COGNITIVE AND NON-COGNITIVE COLLEGE READINESS

IN PARTICIPANTS IN THREE CONCURRENT ENROLLMENT PROGRAMS

AT A NORTH CAROLINA COMMUNITY COLLEGE

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The purpose of this study was to systematically investigate the cognitive and non-cognitive college readiness of students who participated in three concurrent enrollment programs at a North Carolina community college, while controlling for the effects of pre-existing student characteristics. This study compared outcomes between different concurrent enrollment programs, examined the relationship between concurrent enrollment and non-cognitive college readiness, and assessed outcomes in concurrently enrolled students while controlling for pre-existing student characteristics.

Cognitive and non-cognitive college readiness was assessed for a sample of concurrently enrolled participants in Mitchell Community College's Huskins dual credit program (n = 42), non-Huskins dual enrollment program (n = 10), and early college high school (n = 31). College readiness was also assessed for two comparison groups: non-concurrently enrolled college bound high school students (n = 32), and regularly matriculated college students (n = 50). Cognitive college readiness variables included the

percentage of students earning grades of C or better in college transfer courses and the number of colleges at various degrees of entrance difficulty into which recently-graduated seniors were accepted. Non-cognitive college readiness variables included commitment to education, self- and resource-management skills, interpersonal and social skills, academic success skills, and career planning skills.

After controlling for the effects of age, ethnicity, gender, prior completion of college transfer courses, completion of developmental education courses, and ACCUPLACER placement test scores, the Huskins group and the non-Huskins dual enrollment group had a higher probability of Cs or better than the college comparison group. After controlling for the effects of age, ethnicity, gender, and pretest levels of the five non-cognitive college readiness variables, a combined group of Huskins and non-Huskins dually enrolled students had significantly higher self- and resource-management skills than the high school comparison group. After controlling for the effects of age, ethnicity, gender, and pretest levels of the five non-cognitive college readiness variables, all three concurrent enrollment groups had significantly higher levels of career planning skills than the high school comparison group. Although the results did not prove the existence of a causal relationship, the finding that positive outcomes remained evident after controlling for the effects of pre-existing student characteristics supports the notion that concurrent enrollment might have a positive impact on college readiness. It is recommended that this approach be replicated in other postsecondary educational settings.

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CHAPTER 1: INTRODUCTION

There is a great deal of evidence supporting the need to increase the education of the American citizenry (Autor, Katz, & Kearney, 2008; Carnevale & Desrochers, 2001; Dohn & Shniper, 2007; Kodrzycki, 2002; Levin, 2005; Levin, 2009; McCabe, 2003; McCabe & Day, 1998). Regardless of ethnicity or gender, lack of postsecondary education results in significantly lower lifetime income, which in turn is associated with lost potential income tax revenues, increased Medicaid and Medicare costs, and increased costs due to incarceration (Levin, 2009). Furthermore, the number of Americans with postsecondary education is insufficient to fill the demand for new jobs (Autor et al., 2008; Carnevale & Desrochers, 2001; Levin, 2005; McCabe, 2000; Pathways to College Network, 2004), making it necessary to hire workers from other countries for these jobs. Levin (2005) asserts that a shortfall of seven-million college educated workers is projected by 2012. By 2020, 67% of Americans will be competing for the 20% of available jobs that will not require postsecondary education (McCabe, 2000).

In the United States, there are a variety of approaches to increasing college readiness. Some approaches, such as concurrent enrollment programs, the Advanced Placement program, and the International Baccalaureate program, attempt to increase college readiness prior to college admission (Waits, Setzer, & Lewis, 2005). Other approaches, such as developmental education courses and college tutoring, are utilized to enhance college readiness after students have already been admitted into two- and four-

year postsecondary institutions. All of these approaches take time, effort, and money to implement. Therefore, outcome assessments of the college readiness of participants are necessary for all of them. This study focuses specifically on concurrent enrollment programs at a North Carolina community college.

Concurrent enrollment is "participation in college level courses and the earning of college credits by high school students" (Kleiner & Lewis, 2005, p. 1). The three forms of North Carolina concurrent enrollment examined in this study are the Huskins program, non-Huskins dual enrollment (which is usually referred to in North Carolina simply as "dual enrollment" or "concurrent enrollment"), and the early college high school program. In the Huskins program, public high school students take college classes that are offered primarily for them, and receive both college and high school credit (Mitchell Community College, 2007; North Carolina Community College System & North Carolina Department of Public Instruction, 2008). Non-Huskins dual enrollment consists of high school students registering for college classes that are offered primarily for the enrollment of regularly matriculated college students. In contrast to Huskins students, non-Huskins students are not allowed to displace adult college students, must be at least sixteen (North Carolina Community College System & North Carolina Department of Public Instruction), and do not necessarily earn high school credit for their college courses (Mitchell Community College, 2007). Early college high schools are semi-autonomous high schools, typically located on college campuses, that allow high school students to earn both high school diplomas and associate degrees within a five-year period (North Carolina New Schools Project, 2008).

The objectives of the Huskins and non-Huskins dual enrollment programs in North Carolina are "to provide an opportunity for high school students to participate in college courses not otherwise available, to enhance the motivation and achievement of high school students, to encourage high school students to utilize post secondary opportunities as a means for pursuing lifelong educational and training goals, and to maximize the use of State resources while not duplicating course offerings" (North Carolina Community College System & North Carolina Department of Public Instruction, 2008, p. 2). The primary goals of early college high schools in North Carolina are "to attract students who are often under-represented in post-secondary education: (such as) minorities, students from low-income families, and first-generation college students" (North Carolina New Schools Project, 2008, ¶ 2), and to provide the opportunity, the level of challenge, and the level of support necessary for them to achieve both a high school diploma and two years of college credit while still in high school (North Carolina New Schools Project, 2008).

Statement of the Problem

Concurrent enrollment is believed to have the potential to increase college readiness and admission rates (American Institutes for Research & SRI International, 2007; Bailey & Karp, 2003; Early College High School Initiative, 2007; Karp & Hughes, 2008; Kim, 2006; Mitchell Community College, 2007; North Carolina New Schools Project, 2008; Richardson, 1999; Swanson, 2007). As such, it may play an important role in the development of a more educated citizenry in the United States.

The extent to which concurrent enrollment programs succeed at increasing college readiness, however, has not been sufficiently examined. There is a need for more

systematic assessment of outcomes. A lot of time and money are being spent on the development and implantation of these programs. Because early college high schools are autonomous institutions with their own teachers and administrators, and often their own buildings, they are especially expensive. In 2003, the projected cost of an early college high school on a two-year campus during the first year of implementation (with full enrollment) was $2,493,388. The college share of this cost was projected at $889,475, the high school share was projected at $1,334,694, and grants and other sources were projected at $269,219 (Webb, 2004). Although the other forms of concurrent enrollment programs are less expensive, they usually offer free tuition and often offer free textbooks, and thus they also cost taxpayers money (Karp, Bailey, Hughes, & Fermin, 2004; Mitchell Community College, 2007). Idaho state superintendent Tom Luna recently requested three and a half million dollars for concurrent enrollment ("State Pitches Cash for Dual Enrollment Program," 2008). Five million dollars were allotted for all concurrent enrollment programs in Pennsylvania in 2005-2006 (Pennsylvania Workforce Development, 2005). In 2004, President Bush made a proposal for one hundred twenty-five million dollars to promote concurrent enrollment (Office of the Press Secretary, 2004).

Although there is a large amount of literature on concurrent enrollment, most of it focuses on program implementation or descriptive student outcomes (Golann & Hughes, 2008; Karp & Hughes, 2008). There are few empirical studies examining the effects of concurrent enrollment on college readiness while controlling for the effects of possible confounding variables (Bailey & Karp, 2003; Karp, Calcagno, Hughes, Jeong, & Bailey, 2008; Lerner & Brand, 2006). Furthermore, there are not many studies comparing

differences in student outcomes between different forms of concurrent enrollment. The few studies that do exist typically compare concurrent enrollment courses taught by high school instructors with concurrent enrollment courses taught by college instructors (Hebert, 2001; Hobbs, 2008), or they compare concurrent enrollment courses taught on high school campuses with concurrent enrollment courses taught on college campuses (Burns & Lewis, 2000; Hobbs, 2008; Smith, 2007). Research examining outcome differences in concurrent enrollment programs all taught by college faculty on college campuses is very uncommon.

Purpose of the Study

The purpose of this study was to systematically investigate the cognitive and non-cognitive college readiness of students who participated in three concurrent enrollment programs at a North Carolina community college, while controlling for the effects of pre-existing student characteristics.

Definitions of the Terms

Concurrent Enrollment

Concurrent enrollment can be defined as "participation in college level courses and the earning of college credits by high school students" (Kleiner & Lewis, 2005, p. 1). Common synonyms include dual enrollment and joint enrollment (American Association of State Colleges and Universities, 2002; Kleiner & Lewis, 2005).

Huskins Dual Credit Program

Dual credit can be defined as a program in which "high school students can earn both high school and postsecondary credits for the same course" (Kleiner & Lewis, 2005, p. 4). The Huskins program is the dual credit program available to public high school

students in North Carolina. Students who choose to participate have priority registration in classes offered especially for them.

Non-Huskins Dual Enrollment

Officially, non-Huskins dual enrollment is a college-credit only program. However, according to the Coordinator of Secondary/Postsecondary Programs at Mitchell Community College, high school students in this form of concurrent enrollment can petition their principals to receive high school credit (T Cashion, personal communication, January 25, 2008). Non-Huskins dually enrolled students cannot displace regularly matriculated college students (North Carolina Community College System & North Carolina Department of Public Instruction, 2008).

Early College High Schools

Early college high schools allow students who are underrepresented in higher education to simultaneously earn a high school diploma and an associate degree or up to two years of credit toward a bachelor degree, tuition free. These schools are typically located on college campuses (Early College High School Initiative, 2007). The early college high school examined in this study is the Collaborative College of Technology and Leadership (CCTL).

College Readiness

According to Conley (2007), college readiness is "the level of preparation a student needs in order to enroll and succeed, without remediation, in a credit-bearing general education course at a postsecondary institution that offers a baccalaureate degree or transfer to a baccalaureate program" (p. 5).

Cognitive College Readiness

In this study, cognitive college readiness is defined as "the achievement of grades in concurrent enrollment courses that are sufficient for transfer to a four-year college or university (i.e., grades of C or better), and the subsequent acceptance and/or admission into four-year colleges."

Non-Cognitive College Readiness

Non-cognitive college readiness variables include factors other than academic performance that are likely to affect the probability of admission to and success in postsecondary educational settings. The five non-cognitive college readiness variables examined in this study are commitment to education, self- and resource-management skills, interpersonal and social skills, academic success skills, and career planning skills.

- Commitment to education involves being a lifelong learner and knowledge of how education provides important skills and improves employability and earning potential.
- Self- and resource-management skills involve knowledge of how to successfully manage time and money.
- Interpersonal and social skills are knowledge of how to interact effectively with other students and professors.
- Academic success skills is effectiveness at reading, studying, taking notes, and doing research.
- Career planning skills is knowledge about career options, and about which careers match personal skills and interests.

The source of the definitions of each of these five variables is the Administrator's Guide to the College Survival and Success Scale (Liptak, 2006), a survey that measures each of these constructs. More information on these and other non-cognitive college readiness variables is provided in Chapter Two.

Research Questions

The following research questions are addressed by this study:

1. Is the cognitive college readiness of the concurrent enrollment participants at Mitchell Community College (MCC) comparable to the cognitive college readiness of the regularly matriculated college students who are taking college transfer courses with them?
2. There are three types of concurrent enrollment available at MCC: the Huskins dual credit program, the non-Huskins dual enrollment program, and the early college high school (the Collaborative College of Technology and Leadership, or CCTL). Are there differences in the cognitive college readiness of participants in these three programs? If so, which programs are associated with the highest levels of cognitive college readiness?
3. Are there differences in cognitive college readiness between concurrent enrollment participants at MCC and comparable college-bound high school students who have not participated in a concurrent enrollment program?
4. Are there differences in *non-cognitive* college readiness between concurrent enrollment participants at MCC and comparable college-bound high school students who have not participated in a concurrent enrollment program?

5. Are there differences in the *non-cognitive* college readiness of participants in the three concurrent enrollment programs at MCC? If so, which programs are associated with the highest levels of non-cognitive college readiness?
6. Are the effects observed in the first five research questions still evident after controlling for pre-existing student characteristics that may have an impact on cognitive and non-cognitive college readiness?
7. What are the perceptions of concurrently enrolled high school students regarding their experiences?

Significance of the Study

This study is one of the few to compare outcomes between different types of concurrent enrollment programs. A rationale for examining differences in college readiness between students in dual credit programs such as the Huskins program, students in college-credit only programs, and early college high school students is because there are differences between these types of concurrent enrollment programs that seem relevant to these outcomes. For example, early college high schools, both in North Carolina and in other states, appear to emphasize student academic support more than the other two concurrent enrollment options (American Institutes for Research & SRI International, 2007; Early College High School Initiative, 2007; Hughes, Karp, Fermin, & Bailey, 2005; Karp, Bailey, et al., 2004; North Carolina New Schools Project, 2008). Furthermore, early college high schools probably allow greater student access to supportive programs at their host postsecondary institutions (such as college counseling services) than the other two options, due to the fact that early college high school students do not have to leave the college campus to attend their high school classes. On the other

hand, both in North Carolina and on the national level, early college high schools appear to be more explicit in their attempts to recruit "at-risk" students than the other two concurrent enrollment options (American Institutes for Research & SRI International, 2007; Early College High School Initiative, 2007; North Carolina New Schools Project, 2008), so it is possible that early college high school students may begin their concurrent enrollment experiences academically behind the other two types of concurrently enrolled students.

This study is also significant because it is one of the first to investigate the relationship between concurrent enrollment and non-cognitive college readiness. It is important to examine non-cognitive college readiness, because the literature reveals that many non-cognitive variables have a significant effect on college success. For example, Tinto (1975, 1993) documents the effects of non-cognitive variables such as student intentions related to college, commitment to academic goals, adjustment to college, incongruence with the goals and values of the college institution, and social isolation on the decision to drop out of college prior to obtaining a degree. Sedlacek (2004) cites extensive literature demonstrating the useful effects of positive self-concept, realistic self-appraisal, successfully handling the system, a preference for long-term goals, availability of a strong support system, leadership experience, community involvement, and knowledge acquired in a field on the college success of non-traditional students. In this study, The College Survival and Success Scale (Liptak, 2006) was used to measure five non-cognitive college readiness variables that are known to affect college success: commitment to education, self- and resource-management, interpersonal and social skills, academic success skills, and career planning skills (see Appendix A).

In addition, this study is significant because it is one of the few attempts to examine concurrent enrollment outcomes while controlling for pre-existing student characteristics. While there is a great deal of literature reporting positive academic outcomes for concurrently enrolled students, very few researchers control for the effects of variables that may account for the success of concurrently enrolled students outside of the concurrent enrollment programs themselves. This study includes statistical controls for the effects of fourteen control variables on college readiness. As such, it represents a rather unique approach.

Overview of the Methodology

Data were collected in the fall and spring semester of the 2008-09 academic year at Mitchell Community College, as well as at three public high schools in the vicinity of the college. Five groups were involved, including Huskins students, non-Huskins dually enrolled students, early college high school students at CCTL, regularly matriculated college classmates of the three types of concurrently enrolled students, and non-concurrently enrolled high school students who were in the college-preparatory curriculum at their high schools and had grade point averages of at least 2.50. The sample included a total of 169 students.

Cognitive college readiness was assessed by obtaining grades in college transfer courses during these two semesters, as well as data on admissions to two- and four-year colleges collected during the following summer. Because only grades of C or better can transfer as credit to four-year colleges, the percentage of students making a C or better in college transfer courses was calculated as a measure of the college readiness of the three groups of concurrently enrolled students and their regularly matriculated college

classmates. Data on acceptance and admissions into four-year colleges were obtained as an additional measure of the cognitive college readiness of the three concurrently enrolled groups, and also as a measure of the cognitive college readiness of the non-concurrently enrolled high school comparison group. These colleges were coded according to the entrance difficulty rankings assigned to them by Peterson's *Guide to College: 2009* (published in 2008). Although two-year colleges have open enrollment policies, and thus acceptance into them cannot be considered an indicator of college readiness, data on acceptance and admissions into two-year colleges were also obtained. This was done because acceptance and admissions into both two-year and four-year colleges indicate that students are motivated to attempt postsecondary education, regardless of whether or not some of those colleges have open-admissions policies.

Non-cognitive college readiness was assessed through the administration of the College Survival and Success Scale (Liptak, 2006). The five non-cognitive college readiness variables measured by this instrument are commitment to education, self- and resource-management skills, interpersonal and social skills, academic success skills, and career planning skills. Surveys were administered to all three groups of concurrently enrolled students and to the non-concurrently enrolled high school comparison group. Because informed consent to take the survey was not collected from the regularly matriculated college student comparison group, non-cognitive college readiness was not assessed for this group. Students took the College Survival and Success scale twice, first near the beginning of the fall semester (pretest) and second near the end of the spring semester (posttest). Because posttest scores on the five non-cognitive college readiness variables reflect possible effects of concurrent enrollment programs while pretest scores

reflect pre-existing characteristics of the participants, posttest scores were used as criterion variables and pretest scores were used as control variables.

Data on 14 control variables were obtained. These control variables included age, ethnicity, gender, prior completion of college transfer courses, completion of developmental education courses, reading ability, sentence skills ability, arithmetic ability, algebra ability. In addition, pretest levels of commitment to education, self- and resource-management skills, interpersonal and social skills, academic success skills, and career planning skills were assessed as control variables. These data were collected so that the effects of variables other than participation in a concurrent enrollment program could be controlled for in the statistical analysis, thus enhancing support for the notion that differences in cognitive and non-cognitive college readiness might be due to the effects of the concurrent enrollment program.

Finally, three participants from each of the three concurrent enrollment groups were interviewed individually. Participants were asked four questions designed to reveal their perception of the benefits or lack of benefits associated with their concurrent enrollment experiences. Although intensive qualitative analysis of the concurrent enrollment experience is not the purpose of this study, interview data provide a brief glimpse at the outcomes that may be associated with concurrent enrollment from the point of view of the actual participants.

Conclusion

This study is unique because it is among the few to examine whether concurrent enrollment programs are associated with college readiness even after controlling for the effects of pre-existing student characteristics. It is also unique because it represents an

uncommon attempt to determine whether there are differences in the outcomes of different types of concurrent enrollment programs. Furthermore, it is a rare example of a study examining the relationship between concurrent enrollment and non-cognitive college readiness.

However, it is important to be aware of the limitations of this research. Because this study only focuses on concurrent enrollment programs at one North Carolina community college, findings should not be generalized to concurrent enrollment in general. There are characteristics of concurrent enrollment programs in North Carolina that may not apply to concurrent enrollment programs in other states. Furthermore, there are characteristics of concurrent enrollment at Mitchell Community College that may not apply to concurrent enrollment at other postsecondary institutions. There is a need for the assessment of outcomes associated with concurrent enrollment programs across the nation. Perhaps this approach can be used in other postsecondary institutions, both in North Carolina and in other states, to address this need.

CHAPTER 2: REVIEW OF LITERATURE

The purpose of this dissertation was to systematically investigate the cognitive and non-cognitive college readiness of students who participated in three concurrent enrollment programs at a North Carolina community college, while controlling for the effects of pre-existing student characteristics. However, because the development of concurrent enrollment programs is rooted in the assumption that a lack of sufficient college readiness in high school graduates establishes a need for these programs, the significance of concurrent enrollment cannot be fully grasped without an understanding of the need for enhancing the college readiness of high school graduates. Therefore, the first section of this literature review focuses on presenting evidence for the importance of promoting college readiness. The second section focuses on reviewing the literature regarding concurrent enrollment. Because this study examines the relationship between concurrent enrollment and non-cognitive college readiness variables, the third section of this literature review presents evidence regarding non-cognitive variables that correlate with college success.

The Importance of Promoting College Readiness

Most citizens of the United States believe that postsecondary education is helpful for both the country as a whole and for its individual citizens (Copa & Ammentorp, 1997; Hebel, 2000). The decline of jobs requiring unskilled labor has had a direct impact on many people. For some, the assembly-line jobs they held for 20 years or more have

suddenly vanished due to factory downsizing, closing, or out-of-country relocation. Others, following their parents' lead, have embarked on career searches after graduating from high school, only to discover that the only jobs available to them will barely keep them out of poverty and will offer no chance for advancement. The following section is divided into three parts. First, the need for postsecondary education in the United States is established. Second, the shortfall of Americans with postsecondary education is described. Finally, various approaches for reducing this shortfall are presented.

The Need for Postsecondary Education in the United States

Even though people tend to place a high value on postsecondary education, they may not have explicit knowledge of the evidence that supports the need for it. However, there is ample evidence that the need for postsecondary education for the majority of American citizens in the twenty-first century is crucial (Bureau of Labor Statistics, 2007; Carnevale & Desrochers, 2003; Dohn & Shniper, 2007; Kodrzycki, 2002; Levin, 2005; Levin, 2009; McCabe, 2000; U.S. Census Bureau, 2008a).

In today's information and technology-driven economy, modern American workers need to be enabled with the information and skills that will allow them to contribute to the creation of better quality products and services (Carnevale, 1996; McCabe, 2000). Postsecondary education is the source of this enabling, because postsecondary education helps workers develop and hone three sets of skills that are essential for modern American workers (Carnevale, 1996; Clark, 2000):

- Basic academic skills (e.g., the ability to read, write, and do arithmetic),
- Viable occupational skills (e.g., computer literacy), and
- The ability to adapt to change.

The importance of postsecondary education is not just that it creates higher percentages of employees who possess valuable information and skill-sets. The amount of American jobs that *require* postsecondary education as a condition of employment is expected to continue increasing. Between 2006 and 2016, the United States economy is expected to produce 15.6 million new jobs, nearly half of which will require postsecondary credentials. During this time span, the growth rate of jobs requiring postsecondary education is expected to increase by 17% (Bureau of Labor Statistics, 2007). Examples of jobs requiring postsecondary credentials that are expected to be in demand are computer software applications engineers, elementary school teachers, accountants, and auditors (Dohn & Shniper, 2007). As the percentage of jobs requiring postsecondary education increases, the need for unskilled labor decreases.

Another reason why postsecondary education is important for twenty-first century Americans is that the income disparity between people with postsecondary education and people without postsecondary education is increasing (Carnevale, 1996; Carnevale & Desrochers, 1997; Carnevale & Desrochers, 2003; Kodrzycki, 2002). In the early 1980s, the wages of high school graduates began to fall relative to college graduates. In 1980, full-time workers with four-year college degrees earned 36% more than those with only high school diplomas. By 2000, this difference in earnings had almost doubled, with workers having four-year degrees earning two-thirds more than workers having only high school diplomas (Kodrzycki, 2002; Webb, 2009). Even a little college seems to make a difference in earning potential. When all else is equal, people who have some postsecondary education but no degree earn 5% more than high school graduates without any postsecondary education. Individuals with associate degrees earn 20 to 30% more,

and those with bachelor degrees earn twice as much (Carnevale & Desrochers, 2003). In 2004, white male college graduates with some college earned $1,164,000 over a lifetime, compared to $949,000 for white male high school graduates without any further schooling. Lifetime earnings for black males with some college were $896,000, compared to $637,000 for high school graduates without further schooling (Levin, 2009).

An additional reason for promoting postsecondary education is because it has the potential to increase government revenue, while decreasing expenses (Levin, 2009). 2007 census data indicate that the average yearly salary for people with bachelor degrees was $57,181, whereas the average yearly salary for people with only high school diplomas or GEDs was $31,286 (U.S. Census Bureau, 2008a). This represents a loss of $23,895 in income tax revenue per person. In addition, there is less taxpayer money spent on those with postsecondary education, because they are less likely to need Medicare or Medicaid, and they are less likely to be incarcerated (Levin, 2009).

The "Graying of America" further enhances the need for all Americans who are able to work to have the education necessary for employment. Whereas in 1960 there were 5.1 workers per retiree, in 1998 there were only 3.4 workers per retiree. It is projected that by 2020, there will be only two workers per retiree (McCabe & Day, 1998). The Social Security System will benefit from the contributions of every potential worker.

The Shortfall of Americans with Postsecondary Education

As Robert McCabe (2000) emphasizes repeatedly, this country has no one to waste. Unfortunately, our educational system is not meeting the demand for a workforce with an adequate level of postsecondary education. One third of American high school

students do not graduate, and more than half are unprepared for college. Only thirty-eight percent of young workers have a college degree (Webb, 2009). A shortfall of seven million college educated workers is expected in the United States by 2012 (Levin, 2005). 300,000 highly skilled foreign workers immigrate to the United States each year to fill quality jobs that Americans are unprepared to fill (McCabe, 2003).

The cost of this lack of preparation for the twenty-first century economy is substantial. Greene (2000) used several strategies to estimate the financial costs incurred by businesses and higher learning institutions when students leave high school without learning basic skills. These strategies included:

- Estimating direct expenditures by colleges and employers to address a lack of basic skills in people no longer in high school,
- Estimating the amount of money employers spend to address loss of production from under-educated workers (e.g., the costs of inventory control systems, the costs of spell-check programs, etc.),
- Estimating the costs of developmental education for post-secondary institutions versus the costs of producing high school graduates with adequate basic skills,
- Using National Assessment of Educational Progress (NEAP) scores to estimate the number of students lacking skills, and
- Estimating the costs of incarceration, welfare, and unemployment.

From these strategies, Greene estimated that lack of postsecondary education and job readiness costs the nation 16.6 billion dollars per year. Unless effective methods to increase the percentage of Americans who obtain at least some postsecondary education are identified and utilized, the future looks even bleaker. Between 2000 and 2020, as the

educational attainment of many other countries is expected to increase, educational attainment in the United States will be falling for the first time in history (Levin, 2005). It is projected that by 2020, 67% of Americans will be competing for the 20% of available jobs that will not require postsecondary education (McCabe, 2000).

Why does such a high percentage of Americans fail to successfully complete postsecondary education? There are a variety of factors that seem to contribute to this unfortunate circumstance.

One major reason why insufficient numbers of American students are succeeding in postsecondary institutions may be insufficient preparation in high school. In the late 1990s, McCabe and Day (1998) reported that approximately 50% of American community college students tested as academically deficient in at least one subject area. At around the same time, one-fourth of freshmen at four-year colleges and one-half of freshmen at two-year colleges did not make it to their second year (Kirst & Venezia, 2001). Unfortunately, current research does not seem to indicate improvement. Fewer than 20% of eighth graders are on target to be ready for college-level work by the time they finish high school (ACT, Inc., 2008).

The growth of a disadvantaged underclass of immigrants and minorities may also contribute to the lack of academic readiness of American high school graduates. Large numbers of immigrants from less-developed regions of the world are coming to the United States. The greatest numbers of these immigrants come from Latin America and Asia (Le, 2009). According to Pitkin and Simmons (1996), the Latino immigrant population in the United States is projected to increase 6.1 million between 1990 and 2010, accounting for 58% of the total growth of the immigrant population. The Asian

immigrant population is projected to increase 3.9 million between 1990 and 2010, accounting for 35% of the total growth of the immigrant population. Many of these immigrants lack proficiency in the English language, and many lack financial resources. As a result, they often fail to complete a postsecondary educational degree and thus have to compete for low paying, unskilled jobs. A potential source of labor to fill the high percentage of jobs requiring postsecondary education is thus lost (McCabe & Day, 1998).

The percentages of minority groups in the United States are increasing, while the percentage of non-Hispanic whites is decreasing. The U.S. Census Bureau (2008b) projects that by 2050, non-Hispanic whites will only represent 46% of the population. In the future, no single group will dominate. Rather, the norm will be clusters of different ethnicities (McCabe, 2000). As diversity in the United States increases, so do percentages of under-prepared students. Minority groups tend to complete postsecondary education at lower rates than non-Hispanic whites. African Americans earn bachelor degrees at half the rate of white non-Hispanics, while Hispanics earn bachelor degrees at an even lower rate (Cantave & Harrison, 2003; McCabe, 2000). The problem is not necessarily a lack of ability. Rather, minority students may be disadvantaged by factors such as minority language status (National Center for Education Statistics, 1978; Rumberger & Larson, 1998), poverty and a lack of parental education (Bempechat & Ginsburg, 1989), and a lack of responsiveness from an educational system that is controlled by the dominant culture (Corson, 1993).

Approaches for Reducing the Shortfall

There have been a variety of approaches that high schools and colleges have used to address the shortfall of Americans with postsecondary education. Some of these include

- Developmental education,
- Federal TRIO programs,
- Summer bridge programs,
- Tech Prep programs,
- Advanced Placement,
- The International Baccalaureate program, and
- Concurrent enrollment programs.

The first six of these are described briefly in this section. The seventh, concurrent enrollment, is the focus of the remainder of this dissertation.

Developmental Education

A developmental education program is "any organized collection of courses and/or services designed to help under-prepared students succeed" (Boylan, 2002, p. 3). Most often, developmental education consists of special courses offered on college campuses to help students "catch up" to the level they need to be at to succeed in regular college courses (McCabe, 2003). However, developmental education can also consist of non-coursed based learning assistance services provided by colleges, such as tutoring or individualized instruction (Boylan, 2002). Recent data indicates that 28% of college freshmen in the United States need at least one developmental course in reading, writing, or mathematics. The percentage of freshmen taking developmental courses is especially

high in community colleges (Parsad & Lewis, 2003). In recent years, almost 42% of community college freshmen were enrolled in at least one developmental course (U.S. Department of Education, National Center for Education Statistics, 2004).

Federal TRIO Programs

Federal TRIO programs are designed to enable students from low-income families to enter postsecondary education and graduate. At least 2,400 federal TRIO programs are integrated into college campuses across the United States. Examples of these programs include Upward Bound, Student Support Services, and Talent Search. In 2000-01, TRIO programs served 723,000 students, two-thirds of whom came from families with incomes of less than $24,000 (Council of Opportunity in Education, 2001).

Summer Bridge Programs

Summer bridge programs are intensive college orientation programs for incoming first-year college students (Haras & McEvoy, 2005). Typically occurring during the summer prior to the freshman year of college, the goal of these programs is to ease the transition from high school to college while promoting academic and social integration into the college environment (Myers & Drevlow, 1982). Whereas some summer bridge programs are for academically gifted students (ERIC Clearinghouse on Higher Education, 2001), most focus on students who are at risk for dropping out of college (Haras & McEvoy, 2005; Myers & Drevlow, 1982). Summer bridge programs are often funded as part of the Upward Bound federal TRIO program (Owens & Johnson, 2008).

Tech Prep Programs

Tech Prep programs involve collaboration between high schools and community colleges for the purpose of enabling high school students to obtain credit towards

vocational or technical degrees (Haycock, 1998). Tech Prep programs typically operate through an articulation agreement in which high school students must take a sequence of high school courses that count towards credit for certain college courses, often conditional on also completing one or more courses at the partner college (Bragg, 2001; Hughes, Karp, Bunting, & Friedel, 2005). The Carl D. Perkins Vocational and Applied Technology Education Act of 1990, which provides funds to enhance vocational education programs, was a major factor in the creation of Tech Prep (Business Education Resource Consortium 2000; Iowa Department of Education, n.d.). The School to Work Act of 1994, which encourages high schools to include workforce preparation in their curricula, also influenced the creation of Tech Prep (Haycock, 1998).

Advanced Placement

The Advanced Placement program (AP) provides college credit for students who take AP courses and then pass standardized AP course examinations, although it is also possible to get college credit by passing the examinations without taking the courses (The College Board, 2009). The AP examination fees for low-income students are usually paid for by the state (Education Commission of the States, 2009). Started in 1955, Advanced Placement represents one of the oldest forms of collaboration for the purpose of increasing the amount of students who are college-ready (Bailey & Karp, 2003). By the turn of the twenty-first century, advanced placement courses were common. During the 2002-03 school year, 67% of American public high schools offered advanced placement courses, with 1.8 million students enrolled (Waits et al., 2005).

International Baccalaureate

The International Baccalaureate program is a worldwide initiative involving over a hundred nations. It seeks to promote the "intellectual, personal, emotional and social skills to live, learn, and work in a rapidly globalizing world" (International Baccalaureate Organization, 2005-2009, ¶ 1). The International Baccalaureate is similar to Advanced Placement in that students must take special courses while in high school, pass examinations in each subject area, and then receive college credit for these courses upon admission to a postsecondary institution. The courses consist of a two-year liberal arts curriculum that meet requirements established by the International Baccalaureate program, and are taken in the eleventh and twelfth grades. Far fewer American students are enrolled in International Baccalaureate courses (165,000) than in Advanced Placement courses (1.8 million), and they are only offered at two percent of American high schools (Waits et al., 2005).

Concurrent Enrollment

An additional approach to the promotion of college readiness is through concurrent enrollment programs. Concurrent enrollment can be defined as "participation in college level courses and the earning of college credits by high school students" (Kleiner & Lewis, 2005, p. 1). Common synonyms for concurrent enrollment include dual enrollment and joint enrollment (American Association of State Colleges and Universities, 2002; Kleiner & Lewis, 2005). Concurrent enrollment is very common in the United States. In the 2002-03 school year, there were about 813,000 concurrently-enrolled high school students in the United States, representing about 5% of the total number of students. During that same year, 57% of degree-granting colleges had high

school students enrolled in their courses (Kleiner & Lewis, 2005) and seventy-one percent of public high schools allowed their students to enroll in college courses (Waits et al., 2005). As of 2006, forty-two states had policies addressing concurrent enrollment (Western Interstate Commission for Higher Education, 2006). Although four-year colleges and universities may also offer concurrent enrollment opportunities, the majority of these opportunities (about 77%) occur through community colleges (Andrews, 2004; Kleiner & Lewis, 2005). This makes sense, because most participating high schools are in close proximity to community colleges, whereas four-year colleges and universities are often located much further away from participating high schools.

The Evolution of Concurrent Enrollment

The idea that a bridge between high school and college might be helpful is over eighty years old. Kisker (2006) provides the following statement by early junior college advocate George Zook, in a 1921 address to the Texas State Teachers' Association:

> Our higher institutions are spending a wholly unwarranted amount of time in assimilating freshmen and sophomores who are doing a grade of work which each year is becoming more clearly recognized as secondary rather than higher in character. It must be apparent that this situation will some day become intolerable and that a solution should be sought. The junior college is offered as that solution. In order that we may better understand this proposal, it may be well to recall that the junior college is here understood to be two years of work superimposed on a four-year secondary-school course of study. (1922, p. 576).

The earliest example of a concurrent enrollment program detected in the literature dates back to 1928, when Pasadena Junior College and Pasadena High School merged

into a single institution covering grades eleven through fourteen (Wechsler, 2001). Students at this institution received a lot of guidance. For example, eleventh graders at Pasadena were called at home if absent, and received immediate counselor appointments when academic problems arose (Harbeson, 1940).

The most vocal early advocate of the idea to integrate the last few years of high school with the first two years of college was Leonard Koos. In the 1930s and 1940s, Koos aggressively promoted the 6-4-4 plan of public education, which places grades seven through ten in junior high school and grades eleven through fourteen in junior college (Kisker, 2006). According to Koos (1946), the 6-4-4 plan would reduce a large amount of redundancy between secondary and postsecondary coursework, and thus save students and educators time, effort, and money. Although the 6-4-4 plan generated a lot of talk, it was seldom implemented. By 1941, only ten public school systems used the 6-4-4 model (Kisker, 2006; Stoel, 1988). Perhaps the majority of educators of the time agreed with W.C. Eells' (1931) sentiment that combining high school and junior college went against the "psychology of the American people" (p. 720).

Literature on the topic of concurrent enrollment sheds little information on developments of the practice during the 1950s and 1960s. In Kisker's words (2006), it seems that "the idea to integrate high school and community college virtually disappeared…" (p. 78). Only a few of the articles reviewed even mention the 1950s. Educators in the state of Connecticut speak of an undocumented concurrent enrollment program that existed as early as 1955 (Puyear, Thor, & Mills, 2001). Marshall and Andrews (2002) assert that dual credit programs have "roots as far as the 1950s" (p. 238). However, they do not support this assertion by citing a source. It is possible that Marshall

and Andrews were referring to the advent of the Advanced Placement program. Although no additional literature referring to concurrent enrollment programs in the 1950s was located, at least two articles (American Association of State Colleges and Universities, 2002; Puyear et al., 2001) assert that Advanced Placement has roots dating from the 1950s. However, Advanced Placement should not be considered a form of concurrent enrollment, because college credit is given for Advanced Placement courses only if scores on the final examinations are high enough (Andrews, 2000).

Things began to change in the early 1970s. In 1973, Syracuse University began its Project Advance concurrent enrollment program (Puyear et al., 2001). This well-known program expanded significantly during the next twenty years. By 1998-1999, it included 120 high schools located in over five states (Andrews, 2004). Still going strong, Project Advance offers dual credit courses taught in high school classrooms by high school teachers (Project Advance, 2009; Swanson, 2007).

The Middle College High School (MCHS) at LaGuardia Community College is another concurrent enrollment program that dates back to the 1970s. This school was opened in the Bronx section of New York City in 1974 (Carter, 2004; Kisker, 2006). MCHS was created as an attempt to increase local high school retention, improve local graduation rates at the secondary level, and attract local teenage students to higher education (Carter, 2004). Its primary goal was to help underachievers, which it defined as "those who were at a level of achievement significantly below their potential," (Wechsler, 2001, p. 35). However, MCHS also admitted academically successful students if it suspected that these students might thrive in an alternative educational setting. Although MCHS had some difficulty in its initial attempts to integrate high school and

college, it has persevered. As recently as 2001, Wechsler asserted that few other high schools for at-risk students compared as favorably with New York City averages as MCHS.

In one of the first examples of state concurrent enrollment legislation, in 1973, Florida enacted a law providing eligible high school students with concurrent enrollment opportunities (Smith, 2008). To be eligible, students had to pass a placement exam. In addition, students enrolling in vocational certification courses were required to have at least a 2.0 unweighted grade-point average; whereas students enrolling in courses leading to an associate or baccalaureate degree had to have at least a 3.0 grade-point average (Hale, 2002).

Concurrent enrollment programs began to increase in the 1980s (American Association of State Colleges and Universities, 2002). In 1985, Minnesota became the first state allowing eleventh and twelfth graders free college tuition (Boswell, 2001; California Performance Review, n.d.). Central Piedmont Community College, in Charlotte, North Carolina, began offering concurrent enrollment opportunities for Mecklenburg County students in the mid-to-late 1980s; and in Utah, Salt Lake Community College began offering concurrent enrollment opportunities in 1989 (Inside Track, 2002). Illinois Valley Community College and Marquette High School began a concurrent enrollment partnership in 1984-1985. Students in this program took courses designed primarily for other concurrently enrolled high school students at an off-campus location (Marshall & Andrews, 2002). Also, a number of additional middle college high schools were created in the 1980s (Kisker, 2006; Wechsler, 2001).

The frequency of concurrently enrolled students increased dramatically in the 1990s. According to Wilbur and Lambert (1995), there were seventy concurrent enrollment programs in twenty-nine states by 1994. Concurrent enrollment in Virginia increased from 2,800 students in 1991 to 6,700 students in 1998 (Andrews, 2000). According to an article in the Community College Times, by the 1998-99 school year, there were 8,517 concurrently enrolled students in North Carolina ("Dual Enrollment Grows 36 Percent," 2000). In Texas, concurrent enrollment increased fourfold during the 1990s (O'Brien & Nelson, 2004). The National Alliance of Concurrent Enrollment Partnerships (NACEP) was formed in 1999. According to its mission statement, NACEP "links college-school programs offering college courses in high schools. NACEP supports and promotes its constituent partners through quality initiatives, program development, national standards, research, and communication" (National Alliance of Concurrent Enrollment Partnerships, 2007, ¶ 1).

By the first decade of the twenty-first century, concurrent enrollment opportunities were the rule rather than the exception. During the 2002-03 school year, seventy-one percent of American public high schools offered concurrent enrollment options (Waits et al., 2005), 57% of degree-granting colleges had high school students enrolled in their courses, and there were a total of about 813,000 concurrently-enrolled American high school students (Kleiner & Lewis, 2005). In particular, the new millennium has been associated with an increased frequency of early college high schools. With start-up financial support from the Bill and Melinda Gates Foundation, the Early College High School Initiative was started in 2002 (Golann & Hughes, 2008). In 2003, the Bill and Melinda Gates Foundation announced the sponsorship of 70 new early

college high schools across the country (Chmelynski, 2004). With additional funding from the Carnegie Corporation of New York, the W.K. Kellogg Foundation, the Ford Foundation, and other sources, the 13 state-level partners of the Early College Initiative had created almost 160 early college high schools in 24 states by 2007 (Early College High School Initiative, 2007). By the fall of 2009, there were over 200 early college high schools in the United States (Webb, 2009).

Current Varieties of Concurrent Enrollment

As the previous section on the evolution of concurrent enrollment reveals, there are many types of concurrent enrollment programs. This dissertation, however, will focus on the following three varieties:

- Dual credit,
- College-credit only, and
- Early college high schools.

First, a description of these three basic types of concurrent enrollment programs is provided. This is followed with a brief description of some additional variations in the provision of concurrent enrollment, such as variations in course location and instructor credentials.

Dual Credit

One type of concurrent enrollment, dual credit, can be defined as a program in which "high school students can earn both high school and postsecondary credits for the same course" (Kleiner & Lewis, 2005, p. 4). Although concurrent enrollment courses do not always result in high school credit (Hughes, Karp, Bunting, et al., 2005), dual credit is very common. In a national survey conducted by the National Center for Education

Statistics with a sample of approximately 16,500 American public high schools, 11,700 (71%) offered dual credit for college courses in the 2002-03 school year (Waits et al., 2005). Most states have dual credit programs (California Performance Review, n.d.). Well-known, widely researched national examples of dual credit programs include Syracuse University's "Project Advance" program (Andrews, 2004; Project Advance, 2007; Project Advance, 2009; Puyear et al., 2001; Swanson, 2007), Washington State's "Running Start" program (Andrews, 2000; Boswell, 2001; Meld, 2000, as cited in Zarkesh, 2004), and the dual credit program between Illinois Valley Community College and Marquette High School (Marshall & Andrews, 1991; Marshall & Andrews, 2002).

In North Carolina, concurrently enrolled students can earn dual credit through the Huskins program. Huskins courses were developed in North Carolina as a result of the enactment of House Bill 1044, also known as the "Huskins Bill" (North Carolina Community College System & North Carolina Department of Public Instruction, 2008). The ratification of the Huskins Bill in 1983 allowed local school boards and administrative boards in North Carolina to begin providing college-level courses for qualified high school students that weren't otherwise available to them in their high schools. Students in the Huskins program take academic, technical, and/or vocational courses for dual credit in classes that are reserved primarily or exclusively for other concurrently enrolled public high school students in the Huskins program (Gray, 2005). Adult college students are often allowed to register for Huskins classes if seats are available, but high school students are given registration priority. Huskins courses can be taught on North Carolina community college campuses or on high school campuses. Although state requirements allow students to participate in the Huskins program in the

ninth and tenth grades (North Carolina Community College System & North Carolina Department of Public Instruction, 2008), some community colleges only allow juniors and seniors to participate (Mitchell Community College, 2007).

College-Credit Only

There is not a lot of research specifically describing concurrent enrollment programs that only result in college credit, without high school credit. However, such programs do exist. In some states, high school students are allowed to take "stand-alone" college courses through what are sometimes called "singleton" programs (Karp, Bailey, et al., 2004). For example, in the partnership between New York City High School and New York City Community College, high school students take college courses at the high school that only count for college credit (Hughes, Karp, Fermin, et al., 2005).

North Carolina allows high school students to participate in regular college courses without receiving high school credit through non-Huskins dual enrollment. At some North Carolina community colleges, this concurrent enrollment option is simply referred to as "dual enrollment" (Mitchell Community College, 2007) or "concurrent enrollment" (North Carolina Community College System & North Carolina Department of Public Instruction, 2008). In this study, however, the more specific label of "non-Huskins dual enrollment" is being used in order to distinguish it from the Huskins program, which by definition is also a type of dual or concurrent enrollment. Non-Huskins dual enrollment differs from the Huskins program in that the enrollment of these high school students in college courses cannot displace adult college students (North Carolina Community College System & North Carolina Department of Public Instruction, 2008). As a result, non-Huskins dually enrolled students take classes that are

dominated by older students. Another difference is that courses in the non-Huskins dual enrollment program are officially taken for college-credit only (Mitchell Community College, 2007), although the Coordinator of Secondary/Postsecondary Programs at Mitchell Community College asserts that students may petition their high school principals for high school credit (T. Cashion, personal communication, January 25, 2008). In North Carolina, these students must be at least sixteen years of age (North Carolina Community College System & North Carolina Department of Public Instruction, 2008).

Early College High Schools

According to the Early College High School Initiative website (Early College High School Initiative, 2007, ¶ 2), early college high schools

> are designed so that low-income youth, first-generation college goers, English language learners, students of color, and other young people underrepresented in higher education can simultaneously earn a high school diploma and an Associate's degree or up to two years of credit toward a Bachelor's degree—tuition free.

Emphasis is placed on challenge rather than remediation. The philosophy behind this concept is that high school students who are unlikely to attend college and for whom society has low aspirations usually possess the intellectual ability to succeed in college, but are hindered by a lack of college expectations, meaningful college exposure, sufficient academic rigor, and sufficient "habits of the mind" required for college success (Webb, 2009). Early college high schools are usually located on the campuses of postsecondary institutions, and are designed to contain no more than 100 students per

grade (Early College High School Initiative, 2007). As of the fall of 2009, there were over 200 early college high schools in 24 states. Half of these students were the first in their families to attend college, nearly 60% qualified for free- or reduced-lunch programs, and three-fourths were students of color (Webb, 2009).

With 69 early college high schools as of the fall of 2009, North Carolina leads the nation in this form of concurrent enrollment (Webb, 2009). This number represents about a third of the total number of similar schools nationwide (North Carolina New Schools Project, 2009a). The creation of early college high schools in North Carolina is guided by the New Schools Project. Backed by an eleven million dollar grant from the Gates Foundation (North Carolina School Boards Association, 2004), the New Schools Project initiative was formed in 2003 to create up to one hundred new small high schools across the state. Along with the creation of redesigned high schools, the New Schools Project is attempting to meet this goal by creating "Learn and Earn" early college high schools. These schools will include no more than one hundred students per grade level, and emphasis will be placed on academic rigor, the relevance of curriculum to the lives of students, and the creation of a highly supportive learning environment (North Carolina New Schools Project, 2008). North Carolina early college high schools are usually located on the campuses of community colleges, but nevertheless they are semi-autonomous institutions with their own principals and teachers (North Carolina New Schools Project, 2008).

Additional Variations in the Provision of Concurrent Enrollment

In addition to these three basic types of concurrent enrollment, there are several variations in how these programs are implemented. These include differences in

- Course location,
- Instructor credentials,
- Who pays for concurrent enrollment courses, and
- The requirements for admission into concurrent enrollment courses.

Course location. During the 2002-03 school year, a nationwide survey revealed that far more concurrently enrolled students were taught on high school campuses (74%) than on postsecondary campuses (23%), suggesting that most concurrently enrolled students were taking their college-level courses in environments consisting almost exclusively of other high school students (Waits et al., 2005). This particular type of concurrent enrollment program, usually offered for dual credit, is sometimes referred to as "college in a high school" (California Performance Review, n.d.). Examples of colleges in high schools include the partnership between New York City Community College and New York City High School (Hughes, Karp, Fermin, et al., 2005), Syracuse University's Project Advance program (Swanson, 2007), and the dual credit program offered by Arizona's Rio Salado College (Puyear et al., 2001). At other times, dual credit courses are taught in postsecondary institutions (American Association of State Colleges and Universities, 2002; Puyear et al., 2001). In fact, college in a high school is not even an option in some states. Colorado, South Dakota, and Vermont only allow concurrent enrollment courses to be taught on college campuses (Karp, Bailey, et al., 2004).

Instructor credentials. In addition to variation in the location of courses, there is also variation in who teaches concurrent enrollment courses. Dual credit courses are taught by either qualified high school instructors or by college faculty (Hebert, 2001). Most states do not have regulations regarding concurrent enrollment instructors. Of the states that do have regulations, there is a great deal of variation on who can teach dual credit courses. Wyoming allows any high school teacher to teach dual credit courses. Oklahoma, Oregon, and Tennessee allow secondary school teachers to teach dual credit courses as long as these instructors have been approved by the college. Arizona, Missouri, North Dakota, Texas, and Utah require that high school teachers teaching dual credit courses have the same credentials as postsecondary faculty, which is usually at least a Masters degree in the area of instruction. Georgia only allows postsecondary instructors to teach dual credit courses (Karp, Bailey, et al., 2004). Regardless of who teaches the courses, colleges usually try to ensure that concurrently enrolled students are held to the same standards as regular college students by overseeing the contents of the course syllabi (Karp & Hughes, 2008).

Payment responsibility. There is variation in who pays for concurrent enrollment classes. Although concurrent enrollment opportunities are usually free for students in North Carolina and in many other states (Karp, Bailey, et al., 2004; Mitchell Community College, 2007), this is not the case everywhere. In Alabama, Arkansas, California, Kansas, Oklahoma, and South Dakota, concurrently enrolled high school students must pay tuition (Karp, Bailey, et al., 2004). In Colorado, students have to pay up front and are reimbursed later if they successfully complete a concurrent enrollment course (American Association of State Colleges and Universities, 2002).

Requirements for admission. There is also variability in the requirements for admission into concurrent enrollment courses. During the 2002-03 academic year, the most common eligibility requirement was a minimum high school grade-point average. Sixty-six percent of postsecondary institutions with concurrent enrollment requirements mandated that eligible students must have a minimum grade-point average, while 45% mandated that eligible students must achieve a minimum score on a standardized test (Kleiner & Lewis, 2005). Florida, Hawaii, Michigan, and Mississippi required students to take a placement examination to determine eligibility for concurrent enrollment classes (American Association of State Colleges and Universities, 2002).

Functions

The most basic function of concurrent enrollment programs is to enhance postsecondary academic achievement (Bailey & Karp, 2003; Karp & Hughes, 2008). For early college high schools, the main goal is that high school students earn two years of college credits (American Institutes for Research & SRI International, 2007). The North Carolina New Schools Project, which is the North Carolina intermediary for the national Early College High School Initiative, states in its website that "early college high schools offer the appeal of high school on a college campus along with the opportunity to earn a two-year college degree or two years of college credit (North Carolina New Schools Project, 2008, ¶ 7)." Enhancing academic achievement is also an explicitly-mentioned goal of other concurrent programs in North Carolina, such as the Huskins dual credit program and college-credit only dual enrollment (Mitchell Community College, 2007). There is little doubt that concurrent enrollment programs across the nation would be judged as failures if large numbers of participating high school students failed their

college courses. After all, the whole point of participating in concurrent enrollment programs is to acquire college credits while still in high school.

A related function of concurrent enrollment is to increase the level of rigor for high school students (Early College High School Initiative, 2007; Karp & Hughes, 2008). According to Adelman (2006), the most powerful predictor of college completion is academic intensity in high school. Adelman measures academic intensity through the assessment of earned high school credits in college-preparatory courses. These include courses in advanced mathematics, English, lab sciences, foreign language, and history. Students who have been sufficiently prepared for college-level work in high school have less need for developmental education in college (Swanson, 2007), and presumably have more of the skills and discipline that are necessary to succeed in a postsecondary educational environment. Two decades ago, Marshall and Andrews (1991) asserted that far too many students were coasting toward graduation after their sophomore year of high school. Concurrent enrollment opportunities have the potential to provide students such as these with meaningful, challenging work (Marshall & Andrews, 2002). Even if students do not perform well in concurrent enrollment courses, the experience may still be beneficial if it leads to a realization that they need to increase their level of college preparation (Bailey & Karp, 2003).

Some of the functions of today's concurrent enrollment options meet educational goals that have been around for a long time (Koos, 1946). In 2004, Carol Chmelynski wrote "the concept makes college more affordable…. and gives students a jump start on their careers by eliminating time-wasting activities in the last two years of high school (p. 57)." Nearly 60 years before Chmelynski's assertion, Koos (1946) advocated using the

6-4-4 plan to reduce a large amount of redundancy between secondary and postsecondary coursework, and thus save students and educators time, effort, and money.

Traditionally, concurrent enrollment programs have targeted academically proficient and high-achieving students (Bailey & Karp, 2003). In recent years, however, a number of policy makers, education reform groups, and researchers have begun to argue that concurrent enrollment opportunities can also serve the function of helping "underachievers" experience greater academic success (Golann & Hughes, 2008; Hughes, Karp, Bunting, et al., 2005; Karp & Hughes, 2008). Twenty-first century early college high schools seek to recruit low-income youth, first-generation college goers, English language learners, students of color, and others who are underrepresented in higher education (Early College High School Initiative, 2007). Furthermore, the Middle College High School in New York has always targeted students considered to be at risk for dropping out (Carter, 2004; Wechsler, 2001). In North Carolina, the Huskins dual-credit program and the college-credit only dual enrollment program seek to "improve the equalization of opportunities" (Mitchell Community College, 2007, p. 1). Lords (2000) speculates that many under-achieving high school students could do better, but have simply lost the motivation to work hard because they are bored or because they see no relationship between high school and their future. If this is true, then the rigor and relevance of many concurrent enrollment courses could enhance the motivation and achievement of these students (Bailey, Hughes, & Karp, 2002).

Another function of concurrent enrollment programs is the enhancement of support to students. This is particularly true for early college high schools. According to Nancy Hoffman, a vice president at Jobs for the Future, an organization that helps with

the national administration of the early college high school initiative, a major goal of early college high schools is to "provide students with appropriate adult guidance and support through their first two years of college" (as cited in Chmelynski, 2004). On their website, the North Carolina New Schools Project (2008) acknowledges the importance of supporting its students:

> Teachers know their students well and challenge them to complete rigorous projects and solve complex problems. Teachers know their colleagues well enough to work closely to support every student (New Demands New High Schools section, ¶ 2).

Other North Carolina concurrent enrollment programs also have the goal of providing support, since a state requirement for high school concurrent enrollment coordinators is that they "support and motivate students" (Mitchell Community College, 2007, p. 4).

Some concurrent enrollment programs seek to increase high school retention (Karp & Hughes, 2008). The Middle College High School in New York is example of a concurrent enrollment program with this goal (Carter, 2004). Increasing high school retention may be related to the previously-mentioned goal of increasing high school rigor. Increased rigor is thought by some educators to be associated with a decrease in high school dropout rates, based on the theory that some students drop out of high school because they are bored and unchallenged (American Association of State Colleges and Universities, 2002).

An additional function of some concurrent enrollment programs is to increase the level of cooperation between high schools and postsecondary institutions (Andrews, 2000; Bailey & Karp, 2003). This increased cooperation can benefit both institutions.

High schools can benefit from participation in concurrent enrollment programs by learning better what is expected of their students, and by gaining opportunities to expand their curricula. Postsecondary institutions can benefit from these partnerships by increasing their access to potential enrollees and increasing the visibility of their programs within the community (American Association of State Colleges and Universities, 2002).

There are several other functions of concurrent enrollment programs. Tech-Prep programs, which may involve concurrent enrollment courses, exist to increase the preparation of students for the "world of work" (American Association of State Colleges and Universities, 2002; Haycock, 1998; Karp & Hughes, 2008). Also, some concurrent enrollment programs make courses available to high school students who might otherwise not have an opportunity to take these courses (Hebert, 2001; Karp & Hughes, 2008; Mitchell Community College, 2007).

Sociologist Robert Merton (1957) distinguishes between manifest and latent functions. Whereas manifest functions are intentional and are often referred to as goals, latent functions are unintentional. An important latent function of concurrent enrollment is that it can potentially strengthen the American economy by decreasing the time required for students to complete their education and enter the workforce. It now takes an average of five to five and a half years for non-concurrently enrolled students to obtain a baccalaureate (Andrews, 2004).

Because this research focuses on concurrent enrollment programs in North Carolina, a brief recap of the purposes of concurrent enrollment in North Carolina might be helpful at this point. In summary, the formal objectives of the North Carolina Huskins

and non-Huskins dual enrollment programs are "to provide an opportunity for high school students to participate in college courses not otherwise available, to enhance the motivation and achievement of high school students, to encourage high school students to utilize post secondary opportunities as a means for pursuing lifelong educational and training goals, and to maximize the use of State resources while not duplicating course offerings" (North Carolina Community College System & North Carolina Department of Public Instruction, 2008, p. 2). The primary goals of the early college high school program in North Carolina are "to attract students who are often under-represented in post-secondary education: (such as) minorities, students from low-income families, and first-generation college students" (North Carolina New Schools Project, 2008, ¶ 2), and to provide the opportunity, the level of challenge, and the level of support necessary for them to achieve both a high school diploma and two years of college credit while still in high school (North Carolina New Schools Project, 2008).

Positive Outcomes

Academic Outcomes in Dual Credit and College-Credit Only Programs

Studies not controlling for pre-existing student characteristics. Quantitative studies examining the effects of concurrent enrollment on student outcomes while controlling for pre-existing student characteristics are uncommon (Bailey & Karp, 2003; Golann & Hughes, 2008; Karp, Calcagno, et al., 2008; Lerner & Brand, 2006). However, there is plenty of data indicating that concurrent enrollment is associated with a variety of positive academic outcomes (Andrews, 2004; Chmelysnki, 2004; Finch, 1997; Hanson, 2000; Hebert, 2001; Hughes, Karp, Fermin, et al., 2005; Marshall & Andrews, 2002; Monroe Community College, 2003). Because most of this literature does not explicitly

distinguish whether these programs fall into the dual credit category or the college-credit only category, the literature on the academic outcomes of these two forms of concurrent enrollment is presented together. Literature related to the academic outcomes associated with early college high schools is examined later in a separate section.

Former dual credit participants tend to rate dual credit courses favorably (Andrews, 2004, Marshall & Andrews, 2002). Marshall and Andrews report that 73% of recent graduates of the dual credit program indicated that the dual credit courses they took at Illinois Valley Community College were as good as or better than their current college courses. At the turn of the twenty-first century, 95% of students in the Project Advance program at Syracuse University indicated that they would recommend these dual credit courses to others (Andrews). However, higher student ratings of quality do not necessarily indicate that concurrent enrollment courses result in greater academic benefits. Fortunately, there is a great deal of literature that reveals associations between concurrent enrollment programs and positive academic outcomes. The results of the literature not controlling for pre-existing student characteristics are addressed first.

Concurrent enrollment participants have been found to have better grades in college courses. For example, at Monroe Community College in New York (2003), students with prior concurrent enrollment experience had higher first semester grade point averages than students without prior concurrent enrollment experience. These students also did better on the Monroe Community College reading placement test. A 2002 online article entitled “The Inside Track: Two Experts Discuss Dual Enrollment” (no author identified) reported that Salt Lake Community College concurrently enrolled students had a mean English GPA of 3.48, compared with 3.29 for other students, and a

mean math GPA of 2.48, compared with 2.44 for other students. Hanson (2000) found that the grade-point average of Washington's Running Start students was 3.42, compared to 3.14 for regular freshmen. Hughes, Karp, Fermin, et al. (2005) report that 69% of students in the College Now concurrent enrollment program at New York City Community College got As, Bs, or Cs during the 2003-04 academic year.

Participants in concurrent enrollment programs have also been shown to be more likely to graduate from postsecondary institutions on time than non-participating college students (Kleiman, 2001, as cited in Bailey et al., 2002). At the University of Washington, 41% of participants in its Running Start dual credit program graduated by the end of their fourth year of college, compared to only 31% of the non-participating students (Hanson, 2000). In addition, participants in concurrent enrollment programs often have high rates of acceptance and transfer-credit at four-year colleges and universities. At Southside Virginia Community College, for example, 93.79% of concurrent enrollment course credits transferred successfully (Andrews, 2004).

Concurrent enrollment is not only associated with positive academic outcomes related to postsecondary educational performance. There is some evidence that participation in concurrent enrollment programs is associated with positive academic outcomes related to high school performance. Finch (1997) reported that students who participated in the ACE (Achieving a College Education) and ACE+ dual credit concurrent enrollment program in Arizona's Maricopa Community College District had a high school graduation rate of over 90%, while non-participating students from the same high schools had a graduation rate of only 49%.

Studies controlling for pre-existing student characteristics. Although the data consistently show an association between positive academic outcomes and concurrent enrollment, there is reason for a certain degree of skepticism. First, much of the research showing positive outcomes was conducted by representatives of the concurrent enrollment programs being investigated, and thus may reflect a tendency toward "cheerleading" (Bailey et al., 2002). Research from more objective sources might lead to more accurate, less biased conclusions about the viability and utility of dual credit programs, college-credit only programs, and early college high schools.

Another important reason for skepticism is that the positive academic outcomes that have been associated with concurrent enrollment in many of the previously cited studies are not necessarily caused by the concurrent enrollment programs themselves. Rather, the high quality of the concurrently enrolled students may be the real reason behind these positive academic outcomes (Bailey et al., 2002). To put it another way, good students may have a tendency to do well, regardless of their educational experiences.

Eight studies were located showing positive academic effects of concurrent enrollment that controlled for pre-existing student characteristics. Karp, Calcagno, et al. (2008) found that participating in concurrent enrollment in Florida in 2000-01 and 2001-02 was associated with a greater likelihood of earning a high school diploma, college enrollment, persistence to the second postsecondary semester, remaining enrolled in a postsecondary institution two years after graduating from high school, a higher postsecondary grade-point average, and a higher number of postsecondary credits earned three years after high school graduation. Differences between participants and non-

participants remained statistically significant even after accounting for the effects of high school grade point average, gender, race/ethnicity, socioeconomic status, and limited English proficiency. In New York City, the same study found that participating in concurrent enrollment in 2000-01 and 2001-02 was associated with a greater likelihood of pursuing a bachelor degree, a higher postsecondary grade-point average, and a higher number of postsecondary credits earned three and a half years after high school graduation. Again, these effects remained significant even after accounting for the effects of high school grade point average, gender, race/ethnicity, socioeconomic status, and limited English proficiency. The positive effects of concurrent enrollment observed in this study were especially evident for lower income students and for students with lower high school grade point averages, supporting the notion that concurrent enrollment is an effective way to raise the achievement of disadvantaged or at-risk students.

In a study of dual-credit programs at community colleges in Ohio, Texas, Florida, and Oregon, Kim (2006) found that participation in dual-credit programs was significantly positively correlated with college readiness in mathematics. However, dual-credit was not found to be significantly related to college readiness in reading or writing. Statistical controls for gender, Tech Prep participation, and high school courses were utilized.

O'Brien and Nelson (2004) found that in Texas in the 1990s, concurrently enrolled students earned bachelor degrees sooner after high school graduation than advanced placement students, even after controlling for composite math and English SAT scores, race/ethnicity, participation in the Federal lunch program, and gender. These concurrently enrolled students were also more likely to transfer into four-year

postsecondary programs after one or two years in community colleges than advanced placement students.

At the campuses of the University of Missouri, Eimers and Mullen (2003) found that dual credit students had higher high school class ranks and ACT scores prior to college matriculation than students with no concurrent enrollment experience. Therefore, logistic regression was used to examine the relationship between dual-credit and several academic outcome variables while controlling for class rank and ACT score. The results indicated that dual credit students had a higher likelihood of returning to college the second year than students without concurrent enrollment experience even after accounting for the effects of the control variables. However, the initially significant difference in first-year college grade point average between dual credit students and students without concurrent enrollment experience disappeared when the effects of the control variables were considered.

In a study at the City College of San Francisco (CCSF), Spurling and Gabriner (2002) controlled for the effects of prior-academic performance by dividing former concurrent enrollment participants and non-participants into four groups based on college placement test results. These four groups were *no basic skills placement*, *one basic skills placement*, *two basic skills placement*, and *no placement test taken*. The study also controlled for the effects of age. Results indicated that students with prior concurrent enrollment experience passed a higher percentage of courses in all categories except *two basic skills placement*, and had higher GPAs after matriculating to CCSF in all four categories.

In a longitudinal study, Nitzke (2002) found that dual credit students at a mid-western community college had a significantly higher college grade-point average than non-dual credit students, even after controlling for socioeconomic status and prior-academic performance. In addition, dual-credit experience led to faster college completion for students seeking diplomas. However, dual credit participation was not associated with a greater likelihood of completing a college degree.

Chatman and Smith (1998) compared grade distributions in second and third foreign language courses between students who took the first foreign language course through a dual credit program and students who took the first course through regular on-campus instruction. Data were collected at St. Louis University and at the University of Missouri at St. Louis. At both universities, after controlling for the effects of ACT composite scores, the students who took the first foreign language course through a dual credit program did as well in the second and third courses as the students who took the first course through on-campus instruction.

Finally, a study conducted by the University of Arizona (Richardson, 1999), utilizing data pertaining to freshmen in the fall of 1997, found that concurrently enrolled students had significantly lower drops in grade-point average upon entering the university than other students. Because these students also had higher high school grade-point averages and SAT scores, regression analyses were conducted controlling for the effects of these variables. Even after controlling for the effects of high school grade-point average and SAT scores, the effect of concurrent enrollment on drops in grade-point average remained significant.

Nonacademic Outcomes in Dual Credit and College-Credit Only Programs

Dual credit and college-credit only programs also seem to be associated with several positive nonacademic outcomes. First, students and parents save a great deal of money when they can complete college credit through dual-credit programs (Andrews, 2004, Hale, 2001; Hanson, 2000). As was previously mentioned, concurrent enrollment programs often allow students to receive college credit at little-to-no cost. Marshall and Andrews (2002) reported that "parents have saved $5,000 to $24,000 in tuition expenses for students completing up to one year of college credit through the dual credit program" (p. 241). The cost savings of the University of Washington's Running Start program are very impressive. It was estimated that this program saved taxpayers and parents $37.12 millions dollars in the 1999-2000 year, with $12.5 million saved in tuition and $24.6 million saved in taxes (Andrews, 2004).

A second nonacademic outcome of dual credit and college-credit only programs may be an improvement in the public image of community colleges. Marshall and Andrews (1991; 2002) conducted two studies of student outcomes at Illinois Valley Community College (IVCC). In both studies, the image students had of IVCC improved significantly after enrolling in its dual credit program and graduating. Andrews (2004) asserted that 95% of Syracuse University's Project Advance students recommended Syracuse University concurrent enrollment courses to others. (Unfortunately, the website from which Andrews obtained this information, http://supa.syr.edu/SupaOnline/General/FactSheet.htm, could not be accessed.)

Another important nonacademic outcome of dual credit and college-credit only programs is that they may increase the rates of college enrollment. In the only study

located examining nonacademic outcomes of concurrent enrollment that controlled for pre-existing student characteristics, Smith (2007) examined the relationship between dual-credit and student educational aspirations at Allen County Community College in Kansas. Controlling for the effects of parent's highest level of education, prior grades, course perception, additional reading outside of class, level of importance of school and homework, and parental educational expectations for their children, Smith found that participation in dual-credit programs remained a significant predictor of higher educational aspirations. In one of the few studies finding positive outcomes of concurrent enrollment specifically for at-risk students, Welsh, Brake, and Choi (2005) examined student records of the Kentucky Community and Technical College System. They found that the implementation of concurrent enrollment programs was associated with increased enrollment in community college in general, as well as increased enrollment specific to underserved and underprivileged populations.

Academic Outcomes in Early College High Schools

Research specific to the success rates of early college high schools has revealed several positive academic outcomes. As with other forms of concurrent enrollment, early college high schools are associated with high rates of acceptance and transfer-credit at four-year schools (Chmelynski, 2004; Koszoru, 2005) and with high college grade point averages (Chmelynski, 2004). In 2008, 90% of early college high school students earned college credit, with 40% earning more than a year of college credits (Webb, 2009). Koszoru reports that 98% of students at the College Academy at Broward Community College enroll into a four-year college after graduation. Among North Carolina early college high school students, 82% of college course grades were Cs or better during the

2007-08 academic year (North Carolina New Schools Project, 2009a). Furthermore, in 2008-09, North Carolina early college high school students earned a higher percentage of community college grades of C or better than regularly matriculated college students, with early college high schools students earning Cs or better in 75% of college courses versus regularly matriculated students earning Cs or better in 70% of college courses (North Carolina New Schools Project, 2009c).

As with other forms of concurrent enrollment, early college high schools are not only associated with better college performance; they are also associated with better high school performance. A national study of 44 early college high schools found that in the 2005-06 academic year, 81% of early college high school students passed their standardized English language arts (ELA)/reading examination and 66% passed their standardized mathematics examination. This was compared with high school district averages of 69% in ELA/reading and 57% in mathematics (American Institutes for Research & SRI International, 2007). At Hidalgo Early College High School, in Texas, the graduation rate of 90% is 10% higher than the state average. In lieu of the fact that Hidalgo is one of the poorest cities in the United States and that more than half of the students at Hidalgo Early College High School have a parent that never graduated from high school, this is an intriguing finding (Bill and Melinda Gates Foundation, 2009).

A lot of the research on the effects of early college high school programs on high school performance was conducted in North Carolina. In that state, less than 1% of early college high school students dropped out of high school during the 2007-08 academic year, compared to 4.97% for all high schools statewide. During that same academic year, 86% of early college high schools outperformed comparison high schools in their school

districts on state End-of-Course exams (North Carolina New Schools Project, 2009a). During the 2005-06 and 2006-07 academic years, 72% of ninth grade students who were randomly selected by lottery to attend North Carolina early college high schools successfully completed algebra I (meaning they completed the course and passed the required End-of-Course exam), compared to 61% of ninth grade students who were not selected for the program. Twenty-three percent of these early college high school ninth graders successfully completed algebra II and 88% successfully completed English I, compared to only 3% of students in the control group who successfully completed algebra II and 78% who successfully completed English I (North Carolina New Schools Project, 2009b). In a study of four early college high schools in western North Carolina, Hall (2008) reports a retention rate of 92.6% during the 2006-07 and 2007-08 school years. In addition, the majority of students were proficient on state English I and Algebra I tests. Over 90% of these students stated that their early college experience was positive.

Nonacademic Outcomes in Early College High Schools

There are several positive nonacademic outcomes of early college high schools. One is in the area of student recruitment. Hebert (2001) suggests that the affiliated colleges benefit by gaining access to some of high schools' most gifted students. Peterson (2003) contends that early college high schools can also raise the image of the affiliated colleges' community service efforts. There is also evidence that early college high schools are conducive to positive relationships between students and teachers and enhanced levels of student support. In North Carolina, students who were randomly chosen by lottery to attend early college high schools during the 2005-06 and 2006-07 academic years were reported by researchers as having experienced more positive

relationships with their teachers than students who were not chosen to attend. Researchers also reported that these early college high school students received more support, through activities such as tutoring and sessions to build study skills and math skills, than students in the control group (North Carolina New Schools Project, 2009b). Finally, early college high schools may be particularly beneficial to students who are at risk for dropping out (Early College High School Initiative, 2007). During the 2005-06 academic year, 71% of early college high school students were minorities and 52% came from lower income families (American Institutes for Research & SRI International, 2007). During the 2007-08 academic year, it is estimated that North Carolina early college high schools helped save an estimated potential lifetime cost of $25.78 million for students who might otherwise have dropped out (North Carolina New Schools Project, 2009a).

Concerns

Although those who write about concurrent enrollment tend to focus on its successes rather than its failures, concerns about potential problems associated with concurrent enrollment programs have also been expressed. First, acceptance of concurrent enrollment can generally be guaranteed only in states or institutions that offer the program (Hebert, 2001). In Michigan, the state's attorney general has ruled that institutions have the authority to accept or refuse credits that have also been used to satisfy high school requirements (American Association of State Colleges and Universities, 2002). Boswell (2000) reports that some universities do not accept any concurrent enrollment transfer credits. Limited transferability could pose a major

problem for students with an abundance of concurrent enrollment college credits that live near universities that do not accept these credits.

Another major concern with concurrent enrollment is that some postsecondary institutions are hesitant to accept the credits students earn when someone other than a regular college instructor, such as a high school teacher, has taught the concurrent enrollment classes (Hebert, 2001). Some educators seem to believe that only college instructors can adequately design and implement college courses (Hebert, 2001; Puyear et al., 2001). Reisberg (1998) quotes Gary Ripple, director of admissions at Lafayette College, as saying "We believe a college-level course should be offered on a college campus, taught by a college professor, with college students in the room" (p. A40). Others counter that the critics of high school teachers in concurrent enrollment programs do not appreciate the research and training these teachers must receive to teach concurrent enrollment courses (Reisberg, 1998). Hebert found that college mathematics grades were higher when high school teachers taught prior concurrent enrollment courses than when college instructors taught these courses, indicating that high school teachers may provide excellent learning experiences. Similarly, Hobbs (2008) found that grade point averages in a college-level psychology course at Jefferson State Community College in Alabama were significantly higher when taught by high school instructors than when taught by college instructors. The issue is important because some large concurrent enrollment programs (such as Syracuse University's Project Advance) utilize high school teachers exclusively (Greenburg, 1989; Project Advance, 2009; Swanson, 2007).

There is also criticism about the notion of college in a high school. In a survey of 451 postsecondary institutions, nearly one-third indicated that they were "suspicious" of

credit earned through concurrent enrollment programs conducted in high school settings (Johnstone & Del Genio, 2001). In a case study of concurrent enrollment implementation at a North Carolina community college, administrative personnel indicated that discipline problems were much more significant for high school students taking concurrent enrollment courses in their high schools than for students taking concurrent enrollment courses on the college campus (Smith, 2008). Students often indicate that the environment of a college campus inspires them to take more responsibility (American Association of State Colleges and Universities, 2002). Burns and Lewis (2000) found that high school students may experience more satisfaction and feel more independence when they take concurrent enrollment courses on college campuses rather than on high school campuses. In a study controlling for the effects of parents' highest level of education, grades, course perception, additional reading outside of class, level of importance of school and homework, and parental educational expectations, Smith (2007) found that students who took dual credit courses on college campuses had higher educational aspirations than students who took dual credit courses on high school campuses. These findings suggest that, at least for some, exposure to the college culture may be necessary for the development of the maturity and educational ambition expected of high-achieving college students. Another problem with taking college courses in a high school is that high school facilities may be lacking. For example, high schools often have smaller libraries than colleges.

Despite the literature linking concurrent enrollment to academic success, some critics of concurrent enrollment question whether these classes really provide a "college level" of instruction (Boswell, 2000; Puyear et al., 2001; Smith, 2008). This concern

centers around the possibility that the content of concurrent enrollment courses is watered down in order to help high school students be more successful (Karp & Hughes, 2008). In March 2001, concerns over lack of rigor led the South Dakota Board of Regents to ban concurrent enrollment courses from counting towards college credit (American Association of State Colleges and Universities, 2002). In response to concerns about rigor and quality, several strategies are often used in concurrent enrollment programs to ensure high quality. These strategies include involving college faculty in the selection of course texts and the development of course syllabi, and requiring concurrently enrolled students to achieve the same prerequisite placement test scores or take the same prerequisite courses as their college counterparts prior to being admitted into college courses (American Association of State Colleges and Universities, 2002; Karp & Hughes, 2008).

Concurrently enrolled students are younger than other college students. In North Carolina, early college high school students as young as thirteen share classes with adults (Young, 2006). Therefore, another problem with concurrent enrollment options is the high potential for student immaturity and lack of knowledge. Noel, Levitz, and Saluri (1985) found that students who drop out of college often cite reasons such as being overwhelmed by the new institution, being unfocused, or being unrealistic in their expectations of college. In addition, one of the two students who indicated that he or she would not recommend the dual credit concurrent enrollment program at Illinois Valley Community College indicated that high school students may sometimes be too young to truly understand that doing badly in a dual credit class can permanently hurt their transcripts (Marshall & Andrews, 2002). The California Performance Review (n.d.) recommends limiting high school students to no more than ten percent of enrollment in

any college class. This practice might promote student maturity, because it would lead to a high percentage of more mature role models in the classroom.

A related problem with concurrent enrollment is that such programs may lack sufficient support systems for younger students. In early college high schools, emphasis is placed on the creation of highly supportive environments (Early College High School Initiative, 2007; North Carolina New Schools Project, 2008). For example, in many early college high schools, students are encouraged or required to take an introductory college course focused on what they can expect from college (American Institutes for Research & SRI International, 2007). However, the other types of concurrently enrolled students generally do not receive a great deal formal support. For example, nonacademic supports such as formal mentoring or events that celebrate student accomplishments are often unavailable to concurrently enrolled students who aren't part of an early college program (Hughes, Karp, Fermin, et al., 2005; Karp, Bailey, et al., 2004). Furthermore, even when these types of support are offered by the host postsecondary institutions, the fact that concurrently enrolled students who aren't part of an early college program usually take most of their courses off-campus may interfere with their ability to take advantage of them (Hughes, Karp, Fermin, et al., 2005). For students in these types of programs, parental support may be crucial.

There is also some reason to believe that concurrent enrollment is failing in its goal to bring significantly higher numbers of middle and low high school achievers into a college environment. Although early college high schools do a good job recruiting minorities and lower income students (American Institutes for Research & SRI International, 2007), the impression of at least some researchers is that the majority of

concurrent enrollment participants are still primarily highly motivated, academically skilled students (Bailey et al., 2002). There are several factors that may work to impede the likelihood of enrolling middle or low achievers in concurrent enrollment programs. First, formal recruitment procedures aimed at getting information about these programs to a wide variety of students seem to be lacking. Most students probably learn about these programs informally, and the result may be that only motivated, mature, and responsible students are recruited into them. Second, postsecondary institutions are often unwilling to deal with unprepared or immature students (Hughes, Karp, Fermin, et al., 2005). Only two percent of postsecondary institutions specifically target at-risk students for concurrent enrollment programs, while 85% set academic eligibility requirements for concurrently enrolled students (Golann & Hughes, 2008). The imposition of admission standards may weed out middle or low achievers from participation in concurrent enrollment programs. At least one study has found that there are participation gaps for certain underprivileged groups in concurrent enrollment. Wallace (2006) found that African-Americans, Hispanics, and low-income concurrently enrolled students are underrepresented in Virginia's community college system. However, other studies have found more encouraging results. For example, Meld (2000, as cited in Zarkesh, 2004) found that racial diversity in Washington's Running Start dual credit program was similar to the entire freshman class at the University of Washington. Welsh et al. (2005) found that underserved populations in Kentucky, such as females, African Americans, people from rural areas, and people with low socioeconomic status, are increasing in dual credit courses.

An additional concern is that even when concurrent enrollment programs do recruit large numbers of low high school achievers, they are only setting them up to fail. The fear is that students who have not done well in their previous high school courses will continue to do poorly in their college courses, and thus will begin college with a record of failure (Karp & Hughes, 2008). In order to prevent "starting college on the wrong foot," perhaps college readiness needs to be enhanced *prior* to allowing low-achieving high school students to enroll into college courses.

There are also legal and ethical issues related to having minors on college campuses. When colleges and universities host concurrent enrollment programs on their campuses, there is the potential for exposing underage students to problems such as underage drinking and sexual advances or harassment from older college students (American Association of State Colleges and Universities, 2002). It would behoove the administrators of these postsecondary institutions to insure that the guardians of these underage students have been made aware of these potential dangers, and that their institutions are minimizing these risks as much as possible. Another legal issue related to having minors on college campuses concerns the apparent conflict between the Family Educational Rights and Privacy Act (FERPA) and the need to share information with the high schools of dual credit students. According to FERPA guidelines, colleges cannot share information about students' grades without their consent, and yet high schools must be informed of student grades in dual credit classes in order for concurrently enrolled students to receive high school credit (Smith, 2008). This conflict can be resolved by having concurrently enrolled students and their parents sign a consent form for the release of their dual credit grades to their high schools.

A common complaint from opponents of concurrent enrollment is that it can represent a situation in which taxpayers end up paying twice to educate the same set of students (American Association of State Colleges and Universities, 2002; Boswell, 2000; Puyear et al., 2001). Because concurrently enrolled students are considered both high school and college students, in some states they are eligible for benefits available to both groups. Often called "double dipping," the high schools are provided with average daily attendance (ADA) funds while the colleges are provided with full-time equivalent (FTE) funds for the same students. Although double dipping can enhance the motivation of high schools and colleges to participate in concurrent enrollment programs due to its beneficial effect on mutual profitability, it is politically contentious (Karp, Bailey, et al., 2004). The perception that double dipping represents an unnecessary burden on taxpayers may have led some states deny credit for concurrent enrollment courses that are already offered as regular high school courses, as well as for physical education, art, or developmental courses (American Association of State Colleges and Universities, 2002).

A criticism of early college high schools is that they may create competition over space and financial resources with their host postsecondary schools. Adding an early college high school to a college campus requires financial expenditures and the creation of physical facilities that are likely to be desired by other departments within the college. At the Southern California Middle College High School, for example, the discovery of earthquake faults on the campus has led to limitations on new construction, thus creating a significant strain on space resources (Hughes, Karp, Fermin, et al., 2005). The Middle College High School at LaGuardia Community College has also struggled with the issue of limited space (Wechsler, 2001).

Non-Cognitive College Readiness

Non-cognitive college readiness is defined by the author as "factors other than academic performance that are likely to affect the probability of admission to and success in postsecondary educational settings." The question of how concurrent enrollment might affect non-cognitive college readiness has not been sufficiently addressed by previous research. This is unfortunate, because there is a significant body of literature demonstrating the importance of non-cognitive variables on college readiness. If concurrent enrollment is to achieve its goal of enhancing college readiness, then it behooves those involved with the implementation and administration of concurrent enrollment programs to understand how non-cognitive variables that have been shown to correlate with college success can be addressed by their programs.

The Importance of Involvement and Interaction

One non-cognitive variable that seems to have an effect on college success is student involvement. Alexander Astin (1984) theorizes that student involvement is associated with greater college success because it leads to greater time and effort invested in the college experience. Aspects of student involvement that Astin (1975) found to be related to positive outcomes included living on campus, academic involvement (e.g., students being interested in their courses and having good study habits), and a high degree of student-faculty interaction. These variables were related to both a decreased likelihood of dropping out of college and an increase in satisfaction with college. Later research confirms the positive effects of academic involvement through interest in course content (Tracey & Robbins, 2006), academic involvement through good study habits (Bernold, 2007; Gettinger & Seibert, 2002; Trockel, Barnes, & Egget, 2000), and a high

degree of student-faculty interaction (Astin, 1993; Kuh & Ho, 2001; Thompson, 2001) on college success. There is also research demonstrating that extracurricular student involvement is associated with success in college (Baker, 2007), although this does not seem to be the case when extracurricular activities require students to spend a considerable amount of time off-campus and thus detracts from integration into college life (Astin, 1977). Later research, however, does not consistently support the notion that students living on campus have an academic advantage over commuters (Somera & Ellis, 1996). Commuting students are often older, and may be more focused and academically motivated than many younger campus residents, possibly offsetting the benefits of enhanced student involvement due to living on campus.

In later research, Astin (1993) revealed that the non-cognitive variable having the most significant impact on students' educational development was the frequency of interactions with others on campus. This includes student-student interactions (through behaviors such as discussing course content, working on group projects, and tutoring), as well as student-faculty interactions. These types of interactions were associated with better grade-point averages, better leadership skills, better public speaking skills, and enhanced readiness for graduate or professional school. More current research seems to confirm the positive relationship between student-student interaction and college success (Lamport, 1993; Paul & Brier, 2001; Paul, Poole, & Jakubowyc, 1998; Swenson, Nordstrom, & Hiester, 2008), as well as the relationship between student-faculty interaction and college success (Kuh & Ho, 2001; Thompson, 2001).

Non-Cognitive Variables Contributing to Student Drop Out

Vincent Tinto has done extensive research examining the reasons why students drop out of college. He has found five major non-cognitive variables that contribute to the likelihood of dropping out: student intention, student commitment, student adjustment, incongruence between the student and the institution, and isolation (Tinto, 1993). Intention concerns the educational and occupational goals of students. For example, some college students intend to obtain a degree, whereas others have not yet clarified their educational goals. Commitment deals with the amount of energy, time, and money that students are willing to put into college. Adjustment is the willingness to make necessary changes to meet the new demands of college life. For example, students who were popular and excelled academically in high school may find that they have to study harder and be more socially assertive to make friends and earn good grades in college. Incongruence is essentially a "bad fit" between the characteristics, values, and goals of the student and the college institution. Isolation is the lack of sufficient contact with college peers and faculty.

Research supports the impact of all five of Tinto's (1993) non-cognitive variables on college success. The intention of obtaining the credentials required for entry into a chosen career, especially when coupled with career education programs, is positively correlated with the likelihood of completing a degree (Baker & Taylor, 1998; Waterman & Waterman, 1972; Wessel, Christian, & Hoff, 2003). The importance of student commitment has also been confirmed by research. In 1970, Hackman and Dysinger found a positive correlation between high levels of self-reported commitment to college and persisting in college until a degree is obtained. More current research shows that students

who demonstrate commitment through the efforts they invest into their classes experience higher levels of college success (Cortes-Suarez & Sandiford, 2008; Svanum & Bigatti, 2006).

The ability to adjust to the demands of the new college environment also has an impact on college success (Bonica & Daniel, 2003; Pritchard & Wilson, 2006). For example, Noel et al. (1985) report that students who drop out of college often cite reasons indicating poor adjustment, such as being overwhelmed by the new institution and having unrealistic expectations about what college would be like. Incongruence between the personalities of students and their instructors is associated with diminished student performance, and incongruence between students' values and the values emphasized in their classes is associated with diminished student satisfaction (Westerman, Nowicki, & Plante, 2002). Finally, feelings of isolation are a major reason why students drop out of online courses (Bambara, Harbour, Davies, & Athey, 2009). Minority students are particularly susceptible to the challenges posed by isolation on college campuses (Dolan, 2008).

Non-Cognitive Variables Affecting Non-Traditional Students

There are several lenses through which college students can be viewed as non-traditional. Because this study is an examination of high school students in college settings, non-traditional is being viewed primarily through the "age" lens. However, due to the fact that college students are traditionally white males, non-traditional students can also be viewed through racial and gender lenses. Other unusual characteristics, such as having a physical disability or being extensively involved in collegiate athletics, may also qualify students as being non-traditional. William Sedlacek (2004) examines the impact

of non-cognitive variables on the academic success of racial and ethnic minorities, women, disabled students, and student athletes. Sedlacek focuses on eight non-cognitive characteristics that he views as predictive of the success of these types of non-traditional students: positive self-concept, realistic self-appraisal, successfully handling the system, preference for long-term goals, availability of a strong support person, leadership experience, community involvement, and knowledge acquired in a field.

Research supports the importance of each of these eight non-cognitive characteristics. Having a positive self-concept is associated with higher college grades, higher retention, and higher graduation rates for African American students (McNairy, 1996; Sedlacek, 1999), enhanced academic success for women (Ancis, 1997), and better grades for student athletes (Sedlacek & Adams-Gaston, 1992). Realistic self-appraisal is correlated with success for both traditional and nontraditional students in the areas of college grades, retention, and graduation (Sedlacek, 2004). In regards to non-traditional students, realistic self-appraisal is correlated with higher college grades for African Americans, Native Americans, Asian Americans, and Latinos in the Gates Millennium Scholars program (Sedlacek & Sheu, 2004), and is correlated with higher university grades for women (Ancis & Sedlacek, 1997). The ability to successfully handle the campus system is correlated with college success for African Americans (Fries-Britt & Turner, 2002) and women (Ancis & Sedlacek, 1997). In addition, the ability to handle the system by correctly following directions on applications to precollege orientation programs has been associated with higher college grades (Sedlacek, Bailey, & Stovall, 1984). Long-term goals are predictive of college grades and graduation for African Americans (Tracey & Sedlacek, 1985) and are predictive of graduation for international

students (Moore, 1995). The availability of a strong support person, such as a family member or someone in the educational system who is willing to share good advice (Sedlacek, 2004), is correlated with the academic success of African Americans (Tracey & Sedlacek, 1985), women (Ancis & Sedlacek, 1997), and athletes of all races (Sedlacek & Adams-Gaston, 1992). Leadership activities are associated with higher grade point averages in students of color (Sedlacek & Sheu, 2004) and leadership is also a correlate of success for women in college (Ancis & Sedlacek, 1997). Community involvement is a predictor of academic success for African Americans (Tracy & Sedlacek, 1985), athletes of all races (Sedlacek & Adams-Gaston, 1992), and female undergraduates (Ancis & Sedlacek, 1997). Knowledge acquired in a field, which refers to "out of classroom" types of learning through activities such as volunteering (Sedlacek, 2004), is associated with enhanced college success for African Americans (Tracey & Sedlacek, 1985) and women (Ancis & Sedlacek, 1997).

The Importance of Self- and Resource-Management Skills

An additional non-cognitive factor that has an important effect on college success is self- and resource-management skills. Although the effects of variables related to self and resource management are not emphasized by Astin, Tinto, or Sedlacek, their effects on college success are well-documented. For example, time management skills predict college academic performance the United States (Britton & Tesser, 1991; Loomis, 2000; Macan, Shahani, Dipboye, & Phillips, 1990), Canada (George, Dixon, Stansal, Gelb, & Pheri, 2008), and Malaysia (Md Yunus et al., 2007). For college students with attention deficit hyperactive disorder, academic success is correlated with time management skills and freedom from financial stress (Kaminski, Turnock, Rosen, & Laster, 2006). A variety

of studies have shown that financial difficulty has a negative effect on college success (Maton, Hrabowski, & Schmitt, 2000; Sayer, Chaput De Saintonge, Evans, & Wood, 2002). Other self management skills that are predictive of academic performance in college are the utilization of effective study skills (Bernold, 2007; Carson, Chase, Gibson, & Hargrove, 1992; Gettinger & Seiber, 2002; Trockel et al., 2000), obtaining an adequate amount of sleep (Trockel et al., 2000), and controlling alcohol usage (Berkowitz & Perkins, 1986; Pritchard & Wilson, 2003).

Summary

In America today, postsecondary education is a valuable asset. Postsecondary education enhances skill sets necessary for most jobs (such as reading ability, mathematical ability, and computer literacy), the majority of American jobs today require at least some formal postsecondary education, the income disparity between those with postsecondary education and those without it is increasing, and a populace in which a majority of citizens have a postsecondary education enhances government revenue while decreasing government expenses. In spite of the importance of postsecondary education, there is a projected shortfall of seven million college educated workers by 2012 (Levin, 2005). Reasons for the shortfall of Americans who successfully complete postsecondary education include the lack of adequate preparation in high school and the growth of a disadvantaged underclass of immigrants and minorities. Approaches for reducing this shortfall include developmental education, federal TRIO programs, summer bridge programs, Tech Prep programs, the Advanced Placement program (AP), the International Baccalaureate program, and concurrent enrollment programs.

Concurrent enrollment is defined as "participation in college level courses and the earning of college credits by high school students" (Kleiner & Lewis, 2005, p. 1). The first example of concurrent enrollment detected in the literature dates back to 1928, when Pasadena Junior College and Pasadena High School merged into a single institution (Wechsler, 2001). However, concurrent enrollment was not common until the 1990s. Currently, there are several varieties of concurrent enrollment. Dual credit programs allow high school students to earn both high school and college credit. College-credit only programs are designed to provide only college credit, although students may petition their high schools for high school credit on a case-by-case basis. Early college high schools are high schools on the campuses of colleges that allow students to earn associate degrees while still in high school. The most basic function of concurrent enrollment is to enhance postsecondary achievement. Other functions include increasing rigor for high school students, making college more affordable, eliminating wasted time during the last two years of high school, helping "underachievers" experience greater academic success, enhancing academic support, increasing high school retention, increasing cooperation between high schools and postsecondary institutions, and increasing preparation for the "world of work."

There is a great deal of descriptive data indicating that concurrent enrollment programs are associated with college success. Students tend to evaluate concurrent enrollment courses favorably, they tend to make better grades once they become regularly matriculated students than students who do not participate in concurrent enrollment, and they are more likely to graduate from college than non-concurrently enrolled students. A problem with the research on the successes of concurrent enrollment

programs, however, is that much of it is conducted by representatives of the programs being investigated, and thus may be biased. Another problem is that most of the research focuses on descriptive outcomes, without controlling for confounding variables such as pre-existing student characteristics. Less than a dozen studies were located that controlled for pre-existing student characteristics. In most of these controlled studies, the positive outcomes associated with concurrent enrollment remained evident.

A number of concerns have been expressed about concurrent enrollment. Acceptance of concurrent enrollment credits can only be guaranteed in states or institutions that offer the program in which students participated. Colleges may be hesitant to accept concurrent enrollment credits when someone other than a regular college instructor has taught the classes. Some educators express concern that the content of concurrent enrollment courses is being "watered down" for high school students. There is also concern about the high potential for immaturity and lack of knowledge among concurrently enrolled students, the potential lack of sufficient support systems for concurrently enrolled students, and legal or ethical issues related to the presence of minors on college campuses. Politicians opposed to concurrent enrollment sometimes mention that concurrent enrollment can represent a situation in which taxpayers end up paying twice to educate the same set of students. Also, early college high schools may compete with their host postsecondary institutions for space and financial resources.

Non-cognitive variables, which are defined by the author as "factors other than academic performance that are likely to affect the probability of admission to and success in postsecondary educational settings," have been shown to have a significant impact on college readiness. Non-cognitive variables that have been shown to correlate with college

success include college involvement and interaction, intentions of obtaining a degree necessary for entry into a chosen career, commitment to college success, adjustment to college, congruence between the student and the institution, lack of feelings of isolation, positive self-concept, realistic self-appraisal, successfully handling the system, a preference for long-term goals, availability of a strong support system, leadership experience, community involvement, knowledge acquired in a field outside of the classroom, and self- and resource-management skills. Unfortunately, the question of how concurrent enrollment might affect these important non-cognitive college readiness variables has not been addressed in the literature.

This literature review reveals three main areas in which prior research on the outcomes of concurrent enrollment is lacking. First, there are few studies on the effects of different types of concurrent enrollment programs on college success (Bailey & Karp, 2003). Second, there are few studies on the effects of concurrent enrollment on non-cognitive college readiness. Third, most of the previous research does not control for pre-existing student characteristics that may affect the success of concurrently enrolled students (Bailey & Karp, 2003).

CHAPTER 3: METHOD

Setting

The majority of this research was conducted at Mitchell Community College (MCC), an averaged-sized community college with a fairly diverse student body, in the fall of 2008 and the spring of 2009. According to the Director of Institutional Research and Planning, the curriculum enrollment at MCC in the fall of 2008 was 2982 (Z. Summers, personal communication, March 3, 2009). There is also an early college high school located on the campus of MCC, the Collaborative College of Technology and Leadership (CCTL), which was involved in this study. MCC is located in Statesville, North Carolina, in Iredell County. Between 2005 and 2007, Statesville had an estimated population of 23,245, and Iredell County had an estimated population of 145,967 (U.S. Census Bureau, 2008c).

Research was also conducted at North Iredell High School, South Iredell High School, and West Iredell High School during the 2008-09 academic year. All three schools are located in the Iredell-Statesville Schools district, and are within 20 miles of Mitchell Community College. Iredell-Statesville Schools serves over 20,000 students, placing it among the 20 largest school districts in North Carolina (Schoolwires, Inc., 2008). Academically, students in the Iredell-Statesville Schools district tend to perform above the averages set for the state of North Carolina. In the 2007-08 school year, 79.6% of students in the Iredell-Statesville Schools district performed at or above grade level on

the English I End-of-Course test (compared to 73.1% for the state), 72.2% performed at or above grade level on the Algebra I End-of-Course test (compared to 69.0% for the state), and 80.0% performed at or above grade level on the Algebra II End-of-Course test (compared to 67.2% for the state). Iredell-Statesville Schools percentages were not below state averages for any End-of-Course test. Iredell-Statesville Schools students also had higher average combined SAT scores than state averages (1056 versus 1007) in 2007-08 (Department of Public Instruction, 2009).

Participants

Group Descriptions

Participants included students in three concurrent enrollment programs, as well non-concurrently enrolled students in two comparison groups (see Table 3.1). The concurrently enrolled students originally included 42 Huskins students, 10 non-Huskins dually enrolled students, and 31 early college high school students at CCTL. The first comparison group consisted of 32 juniors and seniors from the three local public high schools who were in college-preparatory programs and had high school grade point averages of at least 2.50 but were not participating in any form of concurrent enrollment. The second comparison group consisted of 50 regularly matriculated MCC students taking courses with the concurrently enrolled high school students included in the study. The non-concurrently enrolled high school students served as the comparison group for the assessment of all non-cognitive college readiness variables and one cognitive college readiness variable (acceptance rates in colleges of various degrees of entrance difficulty). The regularly matriculated MCC students served as the comparison group for the assessment of the other cognitive college readiness variable (probability of Cs or better in

Table 3.1

Participants

Group	Fall *n*	Spring *n*	Description
Concurrently enrolled			
Huskins	42	42	dual credit program
Non-Huskins dually enrolled	10	9	college-credit only[a]
Early college high school	31	30	CCTL program
Non-concurrently enrolled			
High school comparison group	32	32	taking college preparatory curriculum
College comparison group	50	30	in classes with concurrently enrolled students

[a]Even though non-Huskins dual enrollment is officially a college-credit only program, students can petition for high school credit on a case-by-case basis.

college transfer courses).

All high school participants, in the three concurrent enrollment groups as well as in the non-concurrently enrolled high school comparison group, were either juniors or seniors. There were no age restrictions for participants in the regularly matriculated MCC comparison group. Because 20 of the regularly matriculated MCC students who took classes with the concurrently enrolled students in the fall did not take classes with these students in the spring, only fall data were collected on them. As a result, the sample size of the regularly matriculated MCC students decreased from 50 in the fall to 30 in the spring. Also, one non-Huskins dually enrolled student and one early college high school student could no longer be located in the spring, and therefore had to be dropped from the spring sample.

Prerequisites

All of the participants taking college classes at MCC (i.e., all groups except the non-concurrently enrolled high school comparison group) displayed at least the minimum level of academic ability required for admission into their college transfer courses prior to the onset of this study. All of them took the ACCUPLACER placement tests required for enrollment into MCC college transfer courses. Furthermore, the early college high school students and the comparison group of regularly matriculated MCC students who did not achieve the minimum ACCUPLACER scores required for admission into their fall 2008 college transfer courses completed and passed all required developmental courses prior to the onset of the study. Because the other two groups of concurrently enrolled students, Huskins and non-Huskins dually enrolled, were generally not allowed to take developmental courses, only those who achieved the minimum required scores on the

ACCUPLACER tests were allowed to enroll in college transfer courses or participate in this study.

Because Huskins students at MCC must have high school grade point averages of at least 2.50 to be eligible for participation in the program (Mitchell Community College, 2007), only students with high school grade point averages of at least 2.50 were included in the non-concurrently enrolled high school comparison group. This decision was made in an effort to increase the likelihood that the non-concurrently enrolled high school students participating in the study had a level of prior academic achievement similar to that of at least one of the three groups of concurrently enrolled students. Unfortunately, it was not possible to use a minimum grade point average to decrease the likelihood of pre-existing differences between the non-concurrently enrolled high school comparison group and the other two concurrent enrollment groups. Although the early college high school at MCC requires students to maintain at least a 2.00 to continue taking college courses (Brooks, 2009), neither the early college high school nor the non-Huskins dual enrollment program require a minimum G.P.A. for program admission.

As with the concurrently enrolled high school students, it was expected that most of the participants in the non-concurrently enrolled high school comparison group would be high achievers. Only college-preparatory students with GPAs of 2.50 or higher were included. Furthermore, these students were part of a high performing school district (Department of Public Instruction, 2009).

Constructs

Predictor Variables

The predictor variables in this study are the three different forms of concurrent enrollment at MCC. Specifically, these are the Huskins program, the non-Huskins dual enrollment program, and the early college high school. These forms of concurrent enrollment are classified as predictor variables because they may have an effect on cognitive and non-cognitive college readiness, the criterion variables of this study. After all, enhancing college readiness is intrinsic to the very idea of concurrent enrollment. Several of the functions of concurrent enrollment, such as decreasing wasted time during the junior and senior years, increasing rigor in high school, and providing a high level of support, seem likely to have a positive impact on college readiness.

Huskins

The Huskins program allows Iredell County public high school students to take MCC college courses for *dual credit* in classes that are reserved primarily or exclusively for other concurrently enrolled public high school students. At the state level, North Carolina standards require that Huskins students be in grades nine through twelve, and stipulate that local boards of education may opt to pay for textbooks and other student fees (North Carolina Community College System & North Carolina Department of Public Instruction, 2008). At MCC, however, Huskins students must pay for their own textbooks, must be either juniors or seniors, and must be at least 16 years of age. MCC Huskins students must also have good high school attendance and disciplinary records, and must have high school grade point averages of at least 2.50 (Mitchell Community College, 2007). According to the Coordinator of Secondary/Postsecondary Programs at

Mitchell Community College, 276 high school students participated in the MCC Huskins program in the fall of 2008 (T. Cashion, personal communication, February 26, 2009).

Non-Huskins Dual Enrollment

Through the non-Huskins dual enrollment program, North Carolina high school students can also take college courses at MCC by being granted permission to register for college classes on a case-by-case basis. Non-Huskins dual enrollment courses are taken mostly with regularly matriculated college students, and unless students petition their high school principals for dual credit, only college credit is earned (Mitchell Community College, 2007; T. Cashion, personal communication, January 25, 2008). At MCC, most of the students in the non-Huskins dual enrollment program are either home schooled or attend private high schools (T. Cashion, personal communication, January 14, 2008). Fifty high school students participated in the program at MCC in the fall of 2008 (T. Cashion, personal communication, February 26, 2009).

Early College High School

MCC's early college high school, the Collaborative College of Technology and Leadership (CCTL), opened its doors to students in the fall of 2005 (North Carolina New Schools Project, 2008). The mission of CCTL is to "rigorously challenge students by focusing on skills needed to develop North Carolina's future professional, educational, business, and community leaders" (Brooks, 2009, p. 2). Like most early college high schools, CCTL is designed to remain small, so that the instructors can get to know the students and provide them with support. No more than 400 students can be enrolled in the school. CCTL is designed to serve a variety of students, including accelerated learners who are not challenged by traditional high schools, students who are not achieving their

academic potential in traditional high schools, students who are more likely to thrive in a non-traditional high school, students who need more independence in order to excel, students who are at risk for not going to college, students who may not be able to afford college, and first generation college-goers (Brooks, 2009). According to the school counselor, emphasis is placed on the formation of supportive relationships (B. Culbreth, personal communication, January 23, 2008). CCTL students regularly attend "house," which is time devoted to the discussion of issues of special concern to students, the recognition of student achievements, and the fostering of faculty-student relationships.

Criterion Variables

The criterion variables in this study were cognitive and non-cognitive college readiness. Currently, one of the most frequently cited definitions of college readiness is that of Conley (2007). According to Conley, college readiness is

> the level of preparation a student needs in order to enroll and succeed, without remediation, in a credit-bearing general education course at a postsecondary institution that offers a baccalaureate degree or transfer to a baccalaureate program. "Succeed" is defined as completing entry-level courses at a level of understanding and proficiency that makes it possible for the student to consider taking the next course in the sequence or the next level of course in the subject area. (p. 5).

Cognitive College Readiness

Cognitive college readiness was assessed in two ways. First, the percentage of participants making grades of C or better in concurrent enrollment classes was assessed, both in the fall of 2008 and the spring of 2009. The rationale for this decision was that

cognitive college readiness is defined in this study as the achievement of grades that are sufficient for transfer into a college or university, and only courses in which students achieve grades of C or better will transfer. If concurrent enrollment is effective at preparing high school students for college, then concurrently enrolled students would be expected to receive Cs or better in a high percentage of the college transfer classes that they take while in high school.

Second, the number of colleges at various levels of entrance difficulty into which recently-graduated seniors were accepted was assessed. Both two- and four-year colleges were included in these analyses. Entrance difficulty was coded for each college according to the entrance difficulty ratings assigned to them by Peterson's *Guide to College: 2009*. The level of entrance difficulty of the colleges recently-graduated seniors chose were admitted into was also recorded. The entrance difficulty options assigned by Peterson's (2008) are open admission, minimally difficult, moderately difficult, very difficult, and most difficult. If concurrent enrollment programs are effective at preparing high school students for college, then they would be expected to result in higher acceptance and admission rates into colleges coded at higher levels of entrance difficulty.

Non-Cognitive College Readiness

Data were also collected on five non-cognitive college readiness variables: commitment to education, self- and resource-management skills, interpersonal and social skills, academic success skills, and career planning skills (see Table 3.2). These five variables comprise the five scales of the College Survival and Success Scale (Liptak, 2006). Each of these variables was assessed twice, once near the beginning of the study (pretest) and once near the end (posttest). Because concurrent enrollment may have an

Table 3.2

Non-Cognitive College Readiness Variables

Variable	Description
Commitment to education	Being a lifelong learner; knowledge of how education provides important skills and improves employability and earning potential
Self- and resource-management skills	Knowledge of how to successfully manage time and money
Interpersonal and social skills	Knowledge of how to interact effectively with other students and professors
Academic success skills	Effectiveness at reading, studying, taking notes, and doing research
Career planning skills	Knowledge about career options, and about which careers match personal skills and interests

Note. Descriptions of these five non-cognitive college readiness variables are derived from the Administrator's Guide of the College Survival and Success Scale (Liptak, 2006). The effects of these variables on college readiness have been validated by the research of Vincent Tinto (1975; 1993).

effect on commitment to education, self- and resource-management skills, interpersonal and social skills, academic success skills, and career planning skills, posttest scores were regarded as criterion variables. According to Liptak, these five variables are based on factors that Tinto (1975; 1993) asserts influence whether a student remains in college or departs. In addition, research confirms the positive impact of each of them on college success. Commitment (Cortes-Suarez & Sandiford, 2008; Hackman & Dysinger, 1970; Svanum & Bigatti, 2006), self- and resource-management skills (Berkowitz & Perkins, 1986; Britton & Tesser, 1991; George et al., 2008; Kaminski et al., 2006; Loomis, 2000; Macan et al., 1990; Pritchard & Wilson, 2003; Trockel et al., 2000), interpersonal and social skills (Ancis & Sedlacek, 1997; Kuh & Ho, 2001; Lamport, 1993; Paul & Brier, 2001; Paul et al., 1998; Sedlacek & Sheu, 2004; Swenson et al., 2008; Thompson, 2001), academic success skills (Bernold, 2007; Carson et al., 1992; Gettinger & Seibert, 2002; Trockel et al., 2000), and having an informed career plan (Baker & Taylor, 1998; Waterman & Waterman, 1972; Wessel et al., 2003) all enhance the likelihood of success in college. For more in-depth information on the effects of these and other non-cognitive variables on college readiness, refer to the section on non-cognitive college readiness in Chapter Two.

Control Variables

The control variables were pre-existing student characteristics that were thought to have a possible confounding effect on any observed differences between groups in cognitive and non-cognitive college readiness. In order to assess whether the college readiness of the participants could have been the result of the concurrent enrollment programs, it was necessary to control for the effects of these variables. The 14 control

variables included in this study were age, ethnicity, gender, prior completion of college transfer courses, completion of developmental education courses, reading ability, sentence skills ability, arithmetic ability, algebra ability, and pretest levels of the five non-cognitive college readiness variables: commitment to education, self- and resource-management skills, interpersonal and social skills, academic success skills, and career planning skills.

Age was specified as "age at the time of the onset of the study." For students who completed the College Survival and Success Scale, this was their age at the time they completed the pretest survey. For the regularly matriculated MCC comparison group, which did not complete the College Survival and Success Scale, this was their age as of September 15, 2008. The rationale for using this date was that this was close to the mid-point of when the other students were completing their pretest surveys.

Prior completion of college transfer courses was assessed by collecting data on all college transfer courses taken prior to the onset of the study in the fall of 2008. Completion of college developmental courses was assessed by collecting data on all developmental courses taken either prior to the onset of the study or while the study was being conducted. College courses that fell outside of these two categories were not included, because they were seldom taken by concurrently enrolled students at MCC.

The control variables related to prior academic ability (reading, sentence skill, arithmetic, and algebra ability) were assessed by ACCUPLACER placement tests. Students at MCC are required to take the ACCUPLACER tests prior to admission into most college transfer courses. Furthermore, many courses have certain minimal ACCUPLACER scores designated as prerequisites for admission.

Commitment to education, self- and resource-management skills, interpersonal and social skills, academic success skill, and career planning skills were measured at both the beginning and at the end of the 2008-09 academic year. While posttest scores were regarded as criterion variables, pretest scores were included as control variables. The rationale behind this decision is that for the majority of students, the pretest scores reflected levels of the five non-cognitive college readiness variables existing prior to participation in concurrent enrollment programs.

Instrument

The College Survival and Success Scale (Liptak, 2006, see Appendix A) is a sixty-item survey developed to help students quickly identify weaknesses related to success in a college or university. For each item, students read a statement and choose between four options ("a lot like me," "somewhat like me," "a little like me," and "not like me"). According to the manual, it takes an average of 20 minutes to complete. It is scored by hand.

The five non-cognitive college readiness variables assessed by the College Survival and Success Scale (Liptak, 2006) can be more easily understood through consideration of some of the items on the survey used to assess these variables. Commitment to education is measured through items such as "in college, I (would) have an interest in learning all I can" and "in college, I (would) believe that education gives me the tools to learn how to think." Self- and resource-management skills is measured through items such as "in college, I (would) control my alcohol and drug use" and "in college, I (would) learn all I can about financial aid." Interpersonal and social skills is measured through items such as "in college, I (would) lead other people in projects" and

"in college, I (would) join organizations and clubs." Items measuring academic success skills include "in college, I (would) underline or highlight important points while I read" and "in college, I (would) avoid distractions when I study." Items measuring career planning skills include "in college, I (would) create a career portfolio of my accomplishments" and "in college, I (would) explore potential occupations."

In the administrator's guide, Liptak (2006) provides evidence that the College Survival and Success Scale is both reliable and valid. Evidence that the instrument is reliable includes split-half item correlation coefficients ranging from .89 to .92, and test-retest correlation coefficients ranging from .88 to .94. Statistics demonstrating concurrent and construct validity are provided as well. Although no statistics related to predictive validity are provided, Tinto (1975; 1993) provides grounds based on a theoretical synthesis of research for the assumption that the variables measured by the College Survival and Success Scale predict college retention.

Research Design

Causal-comparative research designs are utilized when researchers wish to examine the effects of predictor variables on outcomes in situations where it is not possible to manipulate the predictor variables (Ellis & Levy, 2009). This study is an example of causal-comparative research. The purpose was to investigate the cognitive and non-cognitive college readiness (the criterion variables) of students who participated in the three forms of concurrent enrollment (the predictor variables), while controlling for the effects of pre-existing student characteristics. The random placement of participants into one of the three concurrent enrollment programs or into the non-concurrently enrolled high school comparison group was not an option. High school students, often

with input from their parents and schools counselors, had already decided for themselves whether or not they wanted to participate in concurrent enrollment programs prior to the onset of this study. Furthermore, there was no opportunity to influence the implementation of the three concurrent enrollments programs or how long students would choose to participate in them. The facilitator of this study had no control over any of the predictor variables.

Procedure

Because it was anticipated that most of the concurrently enrolled and non-concurrently enrolled high school students would be under 18, the first task was to obtain informed student and parental consent from all high school participants (see Appendices B and C). This occurred in August and early September, 2008. However, MCC authorities and the committee responsible for the oversight of this dissertation granted permission to use data pertaining to the college comparison group without obtaining informed consent (see Appendix D). There were four reasons why this decision was made:

- This group of students was not being asked to do anything for the study,
- All the necessary data were available through records accessible to the author as an MCC employee,
- It was agreed that personally identifiable information about any of these students would not be released, and
- MCC had the potential to benefit from the results.

The consent form for students, the consent form for parents, and the details of the procedure (including the decision to not require informed consent from the regularly

matriculated college student comparison group) were all approved by Appalachian State University's Institutional Review Board (see Appendix E). Informed consent forms were distributed to students at two orientation meetings for Huskins students, at one orientation meeting for CCTL students, in the students' classrooms, at the students' high schools, and through the mail. Contact with participants was also made at least once over the telephone and through several e-mails in order to give students and parents additional chances to ask questions and express concerns. At MCC, college instructors often served as liaisons for the collection and distribution of consent forms, whereas at the three high schools, high school counselors and teachers served as the liaisons. Students were provided with envelopes in which to return their consent forms in an effort to enhance confidentiality.

In order to provide students with an incentive to participate in the study and return requested materials in a timely manner, they were provided with small coupons and gift cards from local fast food restaurants and a local video store. These incentives were distributed to participants on three occasions: at the beginning of the study in August, halfway through the study in January, and near the end of the study in May. College and high school employees who served as liaisons between the author and the students were also given coupons. As an additional incentive, four participating students were randomly selected for the receipt of three 50 dollar prizes in cash and a 100 dollar prize in cash. The drawing for these four gifts occurred on April 22, 2009, as the end of the spring semester approached. Only students who were still involved the study and who had turned in all requested materials were eligible for these drawings.

After obtaining informed consent, MCC instructors delivered the College Survival and Success Scale (Liptak, 2006) to high school students participating in each of the three forms of concurrent enrollment for them to take as a pretest. The pretest survey was also given by high school employees to the non-concurrently enrolled college-preparatory high school comparison group. Students either completed the surveys immediately, or took them home to complete and return later. This pretest was completed in August through early October, near the beginning of participants' junior or senior years in high school. The same survey was taken again as a posttest in April through early May, near the end of the spring semester.

To assess cognitive college readiness, fall 2008 college transfer course grades were obtained for the three groups of concurrently enrolled high school students and for their regularly matriculated college classmates in the comparison group. Later, at the end of the spring semester, college transfer course grades were again obtained for the concurrently enrolled high school students who took a second college transfer course and for their regularly matriculated college classmates. From these lists of grades, the percentage of courses in which students made Cs or better was calculated for each group. These percentages were considered to be a measure of cognitive college readiness. Because students obviously cannot obtain grades in a class prior to taking the class, it was not be possible to obtain pretest grades prior to the end of the fall semester. However, ACCUPLACER scores in reading, sentence skills, arithmetic, and algebra served as measures of prior academic ability.

During the summer of 2009, data were collected on the acceptance rates of recently-graduated seniors into colleges of various levels of entrance difficulty. Data

were also collected on the entrance difficulties of the colleges these students chose to attend. First, the names of the two- and four-year colleges into which recently-graduated seniors were accepted and the names of the two- and four-year colleges that they chose to attend were obtained through consultation with the students, their parents, and knowledgeable high school personnel (such as school counselors). Second, each college was coded according to Peterson's (2008) entrance difficulty rating. This information was collected only for recently-graduated senior Huskins students, recently-graduated senior non-Huskins dually enrolled students, and recently-graduated non-concurrently enrolled high school seniors from college-preparatory programs. Because CCTL does not graduate its first class until the spring of 2010, early college high school students could not be included in these analyses.

Concurrently enrolled students were also asked four open-ended questions about the impact that their concurrent enrollment experience had on them (see Appendix F). This qualitative information was collected through the use of individual, audio-taped interviews. Three randomly selected students from each of the three forms of concurrent enrollment were selected to respond to these questions, leading a total of nine interviews. All interviews occurred in May, 2009, at the end of the spring semester. Only participants who had taken MCC courses in both the fall 2008 and spring 2009 semesters were interviewed. Seven interviews were conducted on the MCC campus, one was conducted in the student's high school, and one was conducted in the student's home. The analysis of these interviews is discussed in the data analysis section on page 94.

Data were also collected on the 14 control variables that were thought to have the potential to affect cognitive and non-cognitive college readiness. Age, ethnicity, and

gender were obtained from MCC student applications for all groups except the non-concurrently enrolled high school comparison group. For this last group, age, ethnicity, and gender were obtained through consultation with the students and high school personnel, such as counselors, administrators, and teachers. MCC student transcripts were observed to obtain data on prior completion of college transfer courses and completion of college developmental courses. As was previously mentioned, The College Survival and Success Scale was administered in August through early October for the pretest assessment of commitment to education, self- and resource-management skills, interpersonal and social skills, academic success skills, and career planning skills.

The variables related to prior academic ability (reading ability, sentence skills ability, arithmetic ability, and algebra ability) were measured by ACCUPLACER placement test scores. Data on high school grade point averages were collected for the regular college student comparison group. This information was collected by examining the high school transcripts that regular, degree-seeking MCC students are required to send with their applications to the college. Unfortunately, it was impossible to obtain high school grade point averages for the other four groups, because these students were not required to submit their high school transcripts to MCC and permission to access their grade point averages from their high school personnel was not requested on the informed consent forms. Even though comparisons could not be made with other groups, the grade point average of the regular college student comparison group was useful because it provided an estimate of the average academic ability of this group.

Data Analysis

Emphasis was placed on the attainment of both descriptive and inferential statistics. Descriptive statistics were obtained because they are particularly useful in the assessment of whether concurrent enrollment programs at MCC succeed or fail at promoting college readiness. If two or more varieties of concurrent enrollment are found to have extremely high or extremely low levels of college-ready students, this has far greater implications on whether the money and effort being spent on these programs are justified than the presence or absence of significant differences between the programs. To put it another way, taxpayers would be unlikely to care if one form of concurrent enrollment proved to be a little better than the others if all three forms had abysmally low success rates. Nevertheless, inferential statistics were also obtained. Inferential statistics, controlling for the effects of pre-existing student characteristics, were required to investigate the possibility that the college readiness of the participants may have been due to the effects of the concurrent enrollment programs.

The percentage of "grades of C or better" was calculated for each group by dividing the total number of college transfer courses in which students made Cs or better in the fall and spring by the total number of college transfer courses completed in the fall and spring. As such, "grades of C or better" was converted from a categorical variable into a continuous variable. This allowed the use of ANOVAs to search for significant differences between the three groups of concurrently enrolled students and the college comparison group, and ANCOVAs to search for significant differences between groups while controlling for the effects of relevant control variables. The control variables that were entered as covariates included age, ethnicity, gender, prior completion of college

transfer courses, completion of developmental education courses, reading ability, sentence skills ability, arithmetic ability, and algebra ability. The other control variables were not utilized in this analysis because data were unavailable for the college comparison group.

The acceptance rates of seniors into colleges of various degrees of entrance difficulty also yielded continuous data. Therefore, ANOVAs were used to search for significant differences between the three groups of concurrently enrolled students and the college comparison group. Unfortunately, small sample sizes resulted in too much missing data on the control variables to allow the use of ANCOVAs to search for significant differences between groups while controlling for the effects of covariates.

The data on the entrance difficulty of the colleges that high school senior participants were admitted into could not be converted into percentages, and thus remained categorical. Sample sizes were too small to provide the statistical power necessary to justify the use of a nonparametric inferential analysis of group differences in this categorical variable. Therefore, no inferential analyses between groups in the difficulty of the college they chose to attend were conducted. Trends in this data were examined solely through the comparison of descriptive statistics.

Because the non-cognitive college readiness variables were continuous, ANOVAs and ANCOVAs were used to detect potentially significant differences between the three concurrent enrollment groups and the high school comparison group in each of the five variables measured by the College Survival and Success Scale at posttest (Liptak, 2006). Specifically, these analyses were used to search for differences between groups in commitment to education, self- and resource-management, interpersonal and social skills,

academic success skills, and career planning skills. The control variables used in the ANCOVAs were age, gender, ethnicity, and pretest scores on the five College Survival and Success Scale variables. The other control variables were not utilized in the ANCOVAs because data were unavailable for the high school comparison group.

Responses from the individual interviews were interpreted through the use of thematic analysis. Themes were considered to be significant if they were expressed by at least four of the nine interviewees (44%). Themes were coded as "moderately strong" if they were expressed by four, five, or six interviewees (44 to 67%), and they were coded as "very strong" if they were expressed by seven or more interviewees (78 to 100%). Significant themes were considered important because they had the potential to provide a deeper understanding of how concurrently enrolled students perceived the impact of the programs in which they were participating.

Summary

Data were collected in the fall and spring semester of the 2008-09 academic year at Mitchell Community College (MCC) and in three local high schools. Five groups were involved. The treatment groups included Huskins dual credit students, non-Huskins dually enrolled students, and early college high school students at the Collaborative College of Technology and Leadership (CCTL). The two comparison groups included regularly matriculated college classmates of concurrently enrolled students and non-concurrently enrolled high school students with GPAs of at least 2.50 participating in college-preparatory high school curriculums.

In order to assess cognitive college readiness, the probability of grades of C or better in college transfer classes was obtained. Cognitive college readiness was also

assessed by obtaining the frequencies of acceptance and admission into colleges of various degrees of entrance difficulty. Non-cognitive college readiness was obtained by administering the College Survival and Success Scale (Liptak, 2006), which assessed levels of commitment to education, self- and resource-management skills, interpersonal and social skills, academic success skills, and career planning skills. Differences between groups in cognitive and non-cognitive college readiness were analyzed statistically, both before and after controlling for the effects of pre-existing student characteristics. In addition, qualitative data on perceptions of concurrent enrollment experiences were obtained through nine interviews with concurrently enrolled students.

CHAPTER 4: RESULTS

The purpose of this study was to systematically investigate the cognitive and non-cognitive college readiness of students who participated in concurrent enrollment programs at a North Carolina community college, while controlling for the effects of pre-existing student characteristics. The following research questions were addressed:

1. Is the cognitive college readiness of the concurrent enrollment participants at Mitchell Community College (MCC) comparable to the cognitive college readiness of the regularly matriculated college students who are taking college transfer courses with them?
2. There are three types of concurrent enrollment available at MCC: the Huskins dual credit program, the non-Huskins dual enrollment program, and the early college high school (The Collaborative College of Technology and Leadership, or CCTL). Are there differences in the cognitive college readiness of participants in these three programs? If so, which programs are associated with the highest levels of cognitive college readiness?
3. Are there differences in cognitive college readiness between concurrent enrollment participants at MCC and comparable college-bound high school students who have not participated in a concurrent enrollment program?

4. Are there differences in *non-cognitive* college readiness between concurrent enrollment participants at MCC and comparable college-bound high school students who have not participated in a concurrent enrollment program?
5. Are there differences in the *non-cognitive* college readiness of participants in the three concurrent enrollment programs at MCC? If so, which programs are associated with the highest levels of non-cognitive college readiness?
6. Are the effects observed in the first five research questions still evident after controlling for pre-existing student characteristics that may have an impact on cognitive and non-cognitive college readiness?
7. What are the perceptions of concurrently enrolled high school students regarding their experiences?

The first five research questions were addressed with ANOVAs and post hoc tests to detect any significant differences between concurrent enrollment groups and comparison groups in several cognitive and non-cognitive college readiness variables. The sixth research question was addressed with ANCOVAs to detect the presence of significant differences between groups while controlling for the effects of pre-existing student characteristics. The seventh research question was addressed with a thematic analysis of qualitative interview data.

In the following section, a statistical profile of the participants is presented. This is followed by a description of the results pertaining to each research question. As the first five research questions are addressed, relevant descriptive statistics and the results of ANOVAs and post hoc tests are presented. As the sixth research question is addressed, the results of ANCOVAs are presented. An alpha level of .05 is used for all inferential

statistics. The seventh research question is addressed through an examination of qualitative data related to student perceptions of their concurrent enrollment experiences.

Statistical Profile of the Participants

This section begins with a brief description of group sample sizes. Then, descriptive statistics on the pre-existing characteristics of the participants are presented. Specifically, the participants' ages, ethnicities, genders, high school grade point averages, ACCUPLACER placement test scores, and pretest levels of the five non-cognitive variables assessed by the College Survival and Success Scale (Liptak, 2006) are described. Descriptive statistics are presented for the three concurrent enrollment groups, for the two comparison groups, and for the total sample.

Sample Sizes

Group sample sizes are presented in Table 4.1. The total sample consisted of 165 students. Forty-two of these were participants in the Huskins dual credit program, ten were participants in the non-Huskins dually enrolled program, and thirty-one were early college high school students. The non-concurrently enrolled high school comparison group consisted of 32 students, and the regularly matriculated college comparison group consisted of 50 students.

Age

Participant ages are presented in Table 4.1. The age of participants reflects their ages on the date they took the pretest of the College Survival and Success Scale (Liptak, 2006) in first six weeks of the fall, 2008 semester. Because the regularly matriculated college comparison students did not complete the survey, their ages on September 15, 2008 were recorded for this variable. The rationale for this decision was to document the

Table 4.1

Sample Size, Age, Ethnicity, Gender, and GPA

Group	*n*	Mean Age At Pretest	Percent Minority	Percent Female	GPA
Huskins	42	16.8	11.9	66.7	>2.50[a]
Non-Huskins dually enrolled	10	16.8	10.0	50.0	ND[b]
Early college high school	31	16.3	19.4	61.3	ND[b]
High school comparison	32	16.8	25.0	75.0	>2.50[a]
College comparison	50	21.8	24.0	46.0	2.69[c]
Total	165	18.2	19.4	60.0	ND[b]

[a]Huskins and high school comparison participants had at least a 2.50 high school GPA

[b]No data (ND) were available to calculate average high school grade point average.

[c]This statistic is the mean high school GPA for the college comparison group.

ages of students near the beginning of the study. For all groups except the non-concurrently enrolled high school students, participant ages were determined through access with the Mitchell Community College student data base. The ages of the non-concurrently enrolled high school students were determined through student self-report.

The mean age was 18.2 years, with all but nine of the 165 participants (94.5%) between 15 and 24 years of age. The youngest participants were early college high school students (M = 16.3, SD = 0.8). The oldest participants were regularly matriculated college students (M = 21.8, SD = 6.3). The Huskins students, non-Huskins dually enrolled students, and non-concurrently enrolled college bound high school students all had a mean age of 16.8 years. None of the regularly matriculated students were younger than 17, and the oldest was 50. Although the variance was the largest for this group, 82% were within the age range of 17 to 24 (with a mode of 19).

Ethnicity

The percentage of minority students for each group is presented in Table 4.1. For each group, the majority of participants were white. Only 19.4% of the total sample was non-white. The highest percentages of minority students were found in the two comparison groups. Twenty-five percent of the non-concurrently enrolled high school comparison group and 24% of the regularly matriculated college comparison group were ethnic minorities. For the total sample, the percentage of each ethnic group was as follows:

- 80.6% white,
- 8.5% black,
- 5.5% Hispanic,

- 2.4% Asian, and
- 3.0% multicultural or "other."

Gender

The percentage of females for each group is presented in Table 4.1. Although the majority of participants were female (60.0%), the ratio of females to males was much more balanced than the ratio of whites to ethnic minorities. In three groups (the Huskins group, the early college high school group, and the non-concurrently enrolled high school comparison group), females outnumbered mails. However, in the regularly matriculated college comparison group, 54% of the participants were male, and there were equal numbers of males and females in the non-Huskins dual enrollment group.

High School Grade Point Averages

Refer to Table 4.1 for information on the high school grade point averages of the participants. Because the Mitchell Community College data base only includes the high school grade point averages of regularly matriculated students, it was only possible to obtain high school GPAs for the regularly matriculated college comparison group. This information was unavailable for the other four groups. The mean un-weighted high school GPA for the college comparison group was 2.69 (SD = 0.6). Although individual GPAs were unavailable for the Huskins group and the non-concurrently enrolled high school comparison group, all participants from these two groups had at least a 2.50 high school GPA. Huskins students at MCC are required to have high school grade point averages of at least 2.50 to be eligible for participation in the program (Mitchell Community College, 2007), and high school personnel eliminated students with GPAs of

less than 2.50 from the pool of eligibility for participation in the non-concurrently enrolled high school comparison group.

ACCUPLACER Placement Test Scores

All students at MCC must take the ACCUPLACER placement tests prior to enrollment in college transfer courses. Placement test scores in reading ability, sentence skills ability, arithmetic ability, and algebra ability served as measures of prior academic ability for the three concurrent enrollment groups and for the regularly matriculated college comparison group. Because the non-concurrently enrolled high school students were not taking classes at MCC, they did not take the ACCUPLACER placement tests. ACCUPLACER scores can range from 20 to 120. North Carolina college students are required to take developmental courses if they score below 86 in sentence skills, below 80 in reading, below 55 in arithmetic, or below 55 in algebra (Cape Fear Community College, 2010; Lancaster, 2006).

Placement test scores are provided in Table 4.2. Group performance was consistent across all four types of placement tests. For each test, the non-Huskins dually enrolled students scored the highest, followed closely by the Huskins students. The regularly matriculated college students ranked third, and the early college high school students displayed the lowest placement test scores. The average scores of the early college high school students in reading (M = 78.3, SD = 17.9) and algebra (M = 53.2, SD = 18.2) were below the minimum scores necessary for developmental course exemption.

Table 4.2

ACCUPLACER Placement Test Scores

Group	*n*	Reading	Sentence Skills	Arithmetic	Algebra
Huskins	42	91.3	101.6	92.0	79.9
Non-Huskins dually enrolled	10	97.4	105.0	93.2	91.8
Early college high school	31	78.3	88.5	75.5	53.2
College comparison	47[a]	87.2	92.0	82.0	69.1
Total	130	87.3	95.6	84.9	70.7

Note. The high school comparison group did not take the ACCUPLACER placement tests. Therefore, data on reading ability, sentence skills ability, arithmetic ability, and algebra ability were unavailable for this group.

[a]Placement test scores were not located for three regularly matriculated college students, bringing the sample size down from 50 to 47 for these four variables.

Pretest Levels of Non-Cognitive College Readiness

Participants in the three concurrent enrollment groups and the non-concurrently enrolled high school comparison group took the College Survival and Success Scale (Liptak, 2006) twice, once near the beginning of the study (pretest) and once near the end (posttest). The pretest scores served as measures of pre-existing levels of the five non-cognitive college readiness variables. The variables included commitment to education, self- and resource-management skills, interpersonal and social skills, academic success skills, and career planning skills (see Table 3.2 in the "Methods" chapter for additional information on these five variables). College Survival and Success Scale scores can range from 12 to 48 for each of the five variables. Scores between 12 and 23 are considered low, scores between 24 and 36 are considered average, and scores from 37 to 48 are considered high.

The pretest levels of non-cognitive college readiness are provided in Table 4.3. All groups scored either average or high for each of the five variables. The Huskins students had the highest pretest scores in self- and resource-management skills (M = 38.3, SD = 4.8) and interpersonal and social skills (M = 40.6, SD = 4.4). The non-Huskins dually-enrolled students had the highest pretest scores in academic success skills (M = 38.5, SD = 5.6) and were tied with the early college high school students for the highest pretest scores in commitment to education (M = 42.4, SD = 4.0 for both groups). The early college high school students had the highest pretest scores in career planning skills (M = 40.1, SD = 4.7). The non-concurrently enrolled high school comparison group did not score the highest at pretest in any non-cognitive college readiness variable, and scored the lowest in commitment to education (M = 39.3, SD = 5.7).

Table 4.3

Pretest Levels of Non-Cognitive College Readiness

Group	*n*	CTE[a]	SRMS[b]	ISS[c]	ASS[d]	CPS[e]
Huskins	42	41.9	38.3	40.6	37.2	39.2
Non-Huskins dually enrolled	10	42.4	37.7	38.1	38.5	36.1
Early college high school	31	42.4	34.9	40.0	34.9	40.1
High school comparison	32	39.3	37.9	39.8	36.5	36.7
Total	115	41.3	37.2	40.0	36.5	38.5

Note. The college comparison group did not take the College Survival and Success Scale. Therefore, pretest data on the five non-cognitive college readiness variables were unavailable for this group.

[a]CTE = Commitment to Education.

[b]SRMS = Self- and Resource-Management Skills

[c]ISS = Interpersonal and Social Skills

[d]ASS = Academic Success Skills

[e]CPS = Career Planning Skills

Research Question One

The first research question asked whether the cognitive college readiness of the concurrent enrollment participants at MCC was comparable to the cognitive college readiness of the regularly matriculated college students who were taking college transfer courses with them. To answer this question, the probabilities of Cs or better in college transfer classes for the concurrent enrollment groups were compared with the probability of Cs or better for the regularly matriculated college comparison group. ANOVAs and post hoc tests were conducted to detect whether the differences between these groups were statistically significant.

Descriptive Statistics

The percentages of grades of C or better were calculated by dividing the number of college transfer courses in which participants earned at least a C into the total number of courses they completed, and then multiplying by 100. These percentages are presented in Table 4.4. The Huskins students had the highest percentage of Cs or better (93.4%), followed by the non-Huskins dually enrolled students (90.0%), the regularly matriculated college students (80.6%), and the early college high school students (78.6%).

The Results of ANOVAs and Post Hoc Tests

The inferential analyses of grades of C or better were calculated using probabilities rather than percentages. A one-way ANOVA indicated that there were statistically significant differences between groups in the probability of grades of C or better, $F(3, 129) = 2.74$, $p = .05$. The effect size was medium (partial $\eta^2 = .06$). Post hoc comparisons (see Table 4.5) using the Fisher's least significant difference (LSD) test revealed that the probability of Cs or better was significantly higher for Huskins students

Table 4.4

Probability of Cs or Better: Descriptive Statistics

Group	*n*	Probability	*SD*	Percentage
Huskins	42	.93	.20	93.4
Non-Huskins dual enrolled	10	.90	.32	90.0
Early college high school	31	.79	.26	78.6
College comparison group	50	.81	.29	80.6
Total	133	.85	.26	84.9

Note: The data for standard deviation reflects the standard deviation of the probability rather than the standard deviation of the percentage.

Table 4.5

Probability of Cs or Better:

Results of Post Hoc Tests Related to Research Question One

Group Comparisons[a]	Mean Difference	*SE*	*p*
Huskins vs. regularly matriculated	.13	.05	.02
Combined group[b] vs. regularly matriculated	.12	.05	.02

Note. Alpha level = .05.

[a]In each group comparison, the group listed first had a significantly higher probability of making a C or better than the group listed second.

[b]The combined group (n = 52) consisted of Huskins and non-Huskins dually enrolled students pooled together into a single group.

(M = .93, SD = .20) than for regularly matriculated college students (M = .81, SD = .29).

Because the sample size of the non-Huskins dually enrolled students was so small (n = 10), the power to detect significant differences may have been compromised. Therefore, an additional one-way ANOVA on grades of C or better was conducted combining the non-Huskins dually-enrolled group with the Huskins group. Despite the potential increase in statistical power, combining these two groups did not have a substantial effect on the results. Once again, there were statistically significant differences in the probability of grades of C or better, $F(2, 130) = 4.07$, $p = .02$, with a medium effect size (partial $\eta^2 = .06$). Post hoc comparisons using Fisher's least significant difference (LSD) test revealed that the probability of Cs or better was significantly higher for the combined group of Huskins and non-Huskins dually enrolled students (M = .93, SD = .22) than for the regularly matriculated college students (M = .81, SD = .29).

Summary

Results indicated that the cognitive college readiness of each concurrent enrollment group was either significantly higher than or not significantly different from the cognitive college readiness of the regularly matriculated college comparison group. The Huskins group and the combined group had a significantly higher probability of earning Cs or better in college transfer courses than the regularly matriculated college comparison group. The probabilities of Cs or better for the non-Huskins dual enrollment group and the early college high school group were not significantly different from the probability of Cs or better for the regularly matriculated college comparison group. None

of the concurrent enrollment groups had a significantly lower probability of earning Cs or better than the regularly matriculated college comparison group.

Research Question Two

The second research question asked whether there were differences in the cognitive college readiness of participants in the different types of concurrent enrollment programs at MCC. This question was answered in two ways. First, the probabilities of Cs or better in college transfer classes were compared for the three concurrent enrollment groups. Second, the acceptance rates into colleges of various levels of entrance difficulty of the Huskins students were compared with the acceptance rates of the non-Huskins dually enrolled students. ANOVAs and post hoc tests were conducted to detect whether differences between these groups were statistically significant.

Grades of C or Better

Because descriptive statistics on the percentages of Cs or better in college transfer courses are presented in the previous section addressing research question one, only the results of ANOVAs and post hoc tests are presented in this section. Probabilities, percentages, and standard deviations are provided in Table 4.4.

A one-way ANOVA indicated that there were statistically significant differences between groups in the probability of grades of C or better, $F(3, 129) = 2.74$, $p = .05$. The effect size was medium (partial $\eta^2 = .06$). Post hoc comparisons (see Table 4.6) using the Fisher's least significant difference (LSD) test revealed that the probability of Cs or better was significantly higher for Huskins students ($M = .93$, $SD = .20$) than for the early college high school students ($M = .79$, $SD = .26$). When the Huskins and non-Huskins dually enrolled groups were combined, there were statistically significant differences in

Table 4.6

Probability of Cs or Better:

Results of Post Hoc Tests Related to Research Question Two

Group Comparisons[a]	Mean Difference	*SE*	*p*
Huskins vs. early college high school	.15	.06	.02
Combined group[b] vs. early college high school	.14	.06	.02

Note. Alpha level = .05.

[a]In each group comparison, the group listed first had a significantly higher probability of making a C or better than the group listed second.

[b]The combined group (n = 52) consisted of Huskins and non-Huskins dually enrolled students pooled together into a single group.

the probability of grades of C or better, $F(2, 130) = 4.07$, $p = .02$, with a medium effect size (partial $\eta^2 = .06$). Post hoc comparisons using the Fisher's least significant difference (LSD) test revealed that the probability of Cs or better was significantly higher for the combined group ($M = .93$, $SD = .22$) than for the early college high school group ($M = .79$, $SD = .26$).

College Acceptance

For high school seniors in the Huskins group and the non-Huskins dually-enrolled group, data were collected on the colleges into which high school graduates were accepted. College acceptance data were also obtained for seniors in the non-concurrently enrolled high school comparison group. Early college high school students were excluded because that institution had not yet graduated a class of seniors at the time of data collection (the conclusion of the 2008-09 academic year).

Each of these colleges was categorized according to the entrance difficulty ratings assigned to them by Peterson's (2008) *Guide to College: 2009*. The entrance difficulty options assigned by Peterson's are open admission, minimally difficult, moderately difficult, very difficult, and most difficult.

Descriptive Statistics

Even though research question two does not relate to the non-concurrently enrolled high school comparison group, descriptive statistics on this group are included in this section along with descriptive statistics on the Huskins and non-Huskins dual enrollment groups. This approach prevents the need for repetition of content and tables. However, the results of ANOVAs comparing the non-concurrently enrolled high school

comparison group to the concurrent enrollment groups are included later, in the section addressing research question three.

College acceptance. Of the 61 recently-graduated Huskins and non-Huskins dually enrolled seniors and non-concurrently enrolled seniors, 58 (95.1%) were accepted into a college. The 58 students who were accepted received a total of 137 acceptance notifications from two- and four-year colleges. Two of the three students who were not accepted into any colleges were in the non-concurrently enrolled high school comparison group, while the third was in the Huskins group.

Descriptive statistics on acceptance rates into colleges at various levels of entrance difficulty are provided in Table 4.7. Of the 137 college acceptance notifications, 104 (75.9%) were into colleges reported by Petersons' (2008) as having a moderately difficult entrance level. Recently-graduated Huskins students, non-Huskins concurrently enrolled students, and non-concurrently enrolled high school students were all accepted into a higher percentage of colleges with a moderately difficult entrance level than any other category. Acceptance rates for colleges at the other levels of entrance difficulty were much smaller. The next highest percentage of college acceptance was in the open-admission (two-year college) category (12.4%), followed by the minimally difficult category (6.6%), the very difficult category (4.4%), and the most difficult category (0.7%). Only one student was accepted into a college at the most difficult entrance level. This student was part of the non-concurrently enrolled high school comparison group.

College admission. Of the 61 recently-graduated seniors, 54 (88.5%) were admitted into a college. The non-concurrently enrolled high school comparison group had highest percentage of students who were *not* admitted into any college (20.8%). Five of

Table 4.7

Acceptance into Colleges: Descriptive Statistics

Group	*n*	Frequency[a]	Percentage[b]
Open Admission (Two-Year Colleges)			
Huskins	31	4	6.3
Non-Huskins dual enrolled	6	5	38.5
High school comparison group	24	8	13.1
Total	61	17	12.4
Minimally Difficult Entrance Level			
Huskins	31	2	3.2
Non-Huskins dual enrolled	6	1	7.7
High school comparison group	24	6	9.8
Total	61	9	6.6
Moderately Difficult Entrance Level			
Huskins	31	54	85.7
Non-Huskins dual enrolled	6	7	53.8
High school comparison group	24	43	70.5
Total	61	104	75.9

Group	*n*	Frequency[a]	Percentage[b]
Very Difficult Entrance Level			
Huskins	31	3	4.8
Non-Huskins dual enrolled	6	0	0.0
High school comparison group	24	3	4.9
Total	61	3	4.4
Most Difficult Entrance Level			
Huskins	31	0	0.0
Non-Huskins dual enrolled	6	0	0.0
High school comparison group	24	1	1.6
Total	61	1	0.7

[a]Frequencies reflect the number of acceptance notifications at each level of entrance difficulty rather than the number of students at each level of entrance difficulty. In many cases, individual students received acceptance notifications from several colleges.

[b]Percentages were calculated by dividing the acceptance notification frequencies at each level of entrance difficulty into the group's total number of acceptance notifications, and then multiplying times 100.

the seven students who were not admitted into any college were in this group, while the other two were in the Huskins group. Three of these seven students were not accepted into any college, while the other four were accepted into at least one college but chose not to attend.

Descriptive statistics on admission rates into colleges at various levels of entrance difficulty are provided in Table 4.8. Overall, students were most likely to be admitted into colleges with moderate levels of entrance difficulty (57.4%). This was the most popular choice for the Huskins group (74.2%) and for the non-concurrently enrolled high school comparison group (41.7%). However, the non-Huskins dually enrolled students were more likely to be admitted into open admission two-year colleges (66.7%) than into colleges with moderately difficult entrance levels (33.3%).

For college admissions, only descriptive statistics were obtained. Inferential analyses of group differences were not conducted. Because college admissions data were categorical, non-parametric statistics such as chi squares would have been required. Non-parametric statistics generally have less power to detect significant differences between groups than parametric statistics, and therefore require larger group sample sizes than were available in this study.

The Results of the ANOVAs and Post Hoc Tests

Because only one student was accepted at a college coded as "most difficult," this category was omitted from the inferential data analysis. A one-way ANOVA indicated that there were statistically significant differences between groups in the rates of acceptances into open admission, two-year colleges, $F(2, 58) = 6.50$, $p = .003$. The effect size was large (partial $\eta^2 = .18$). Post hoc comparisons (see Table 4.9) using the Fisher's

Table 4.8

College Admission: Descriptive Statistics

Group	*n*	Frequency[a]	Percentage[b]
Not Admitted into College			
Huskins	31	2	6.5
Non-Huskins dual enrolled	6	0	0.0
High school comparison group	24	5	20.8
Total	61	7	11.5
Open Admission (Two-Year Colleges)			
Huskins	31	3	9.7
Non-Huskins dual enrolled	6	4	66.7
High school comparison group	24	6	25.0
Total	61	13	21.3
Minimally Difficult Entrance Level			
Huskins	31	1	3.2
Non-Huskins dual enrolled	6	0	0.0
High school comparison group	24	1	4.2
Total	61	2	3.3

Group	*n*	Frequency[a]	Percentage[b]
Moderately Difficult Entrance Level			
Huskins	31	23	74.2
Non-Huskins dual enrolled	6	2	33.3
High school comparison group	24	10	41.7
Total	61	35	57.4
Very Difficult Entrance Level			
Huskins	31	2	6.5
Non-Huskins dual enrolled	6	0	0.0
High school comparison group	24	2	8.3
Total	61	4	6.6

Note. Because none of the recently-graduated seniors chose to attend a college at the most difficult entrance level, that category was omitted from this table.

[a]Frequencies reflect the number of students admitted into colleges at each level of entrance difficulty.

[b]Percentages were calculated by dividing the frequencies into the total number of recently-graduated seniors, and then multiplying times 100.

Table 4.9

Acceptance into Colleges of Various Levels of Entrance Difficulty:

Results of Post Hoc Tests Related to Research Question Two

Group Comparisons	Mean Difference	*SE*	*p*
Non-Huskins dual enrolled vs. Huskins[a]	.70	.20	.001

Note. Alpha level = .05.

[a]The non-Huskins dual enrollment group had a significantly higher rate of acceptance into two-year colleges than the Huskins group.

least significant difference (LSD) test revealed that the non-Huskins dually enrolled students were significantly more likely to be accepted into open admission, two-year colleges (M = .83, SD = .75) than the Huskins students (M = .13, SD = .34). Since any student who applies at an open-admission college is automatically accepted, these results indicate that the non-Huskins dually enrolled students *applied* to significantly more open-admission colleges than the Huskins students.

Additional ANOVAs did not reveal significant differences between groups at any other levels of college entrance difficulty. Furthermore, combining the Huskins and non-Huskins dually enrolled students did not result in significant differences.

Summary

The second research question asked whether there were differences in the cognitive college readiness of participants in the concurrent enrollment programs. When cognitive college readiness was measured by percentage of Cs or better in college transfer courses, the results indicated an affirmative response to this research question. Post hoc tests revealed that the Huskins group and the combined group had a significantly higher probability of earning Cs or better in college transfer courses than early college high school group (see Table 4.6).

However, when cognitive college readiness was measured by acceptance rates into colleges at higher levels of entrance difficulty, the performance of the three concurrent enrollment groups was fairly equal. In comparisons of acceptance rates into colleges coded as minimally difficult, moderately difficult, and very difficult, no significant differences between groups were detected. In each group, over 90% of recently-graduated seniors were accepted and admitted into college. Furthermore, in each

group, the majority of college acceptance notifications were from colleges coded at the moderate level of entrance difficulty (see Table 4.7). Although post hoc tests revealed that non-Huskins dually enrolled students were significantly more likely than Huskins students to be accepted into colleges at the lowest level of entrance difficulty (open admission, see Table 4.9), this result does not indicate that the non-Huskins dually enrolled students had a lower level of cognitive college readiness.

Research Question Three

The third research question asked whether there were differences in cognitive college readiness between concurrent enrollment participants at MCC and comparable college-bound high school students who did not participate in a concurrent enrollment program. To answer this question, the acceptance rates into colleges of various degrees of entrance difficulty of the concurrent enrollment groups were compared with the acceptance rates of the non-concurrently enrolled high school comparison group. ANOVAs and post hoc tests were conducted to detect whether the differences between these groups were statistically significant. Because descriptive statistics on college acceptance and admission rates are presented in the previous section addressing research question two (see Table 4.7 and 4.8), only the results of ANOVAs and post hoc tests are presented in this section.

The Results of ANOVAs and Post Hoc Tests

A one-way ANOVA indicated that there were statistically significant differences between groups in the rates of acceptances into open admission, two-year colleges, $F(2, 58) = 6.50$, $p = .003$. The effect size was large (partial $\eta^2 = .18$). Post hoc comparisons (see Table 4.10) using the Fisher's least significant difference (LSD) test revealed that the

Table 4.10

Acceptance into Colleges of Various Levels of Entrance Difficulty:

Results of Post Hoc Tests Related to Research Question Three

Group Comparisons	Mean Difference	*SE*	*p*
Non-Huskins dual enrolled vs. high school comparison[a]	.50	.20	.018

Note. Alpha level = .05.

[a]The non-Huskins dual enrollment group had a significantly higher rate of acceptance into two-year colleges than the high school comparison group.

non-Huskins dually enrolled students were significantly more likely to be accepted into open admission, two-year colleges (M = .83, SD = .75) than the non-concurrently enrolled high school students in the comparison group (M = .33, SD = . 48). Since any student who applies to an open-admission college is automatically accepted, these results indicate that the non-Huskins dually enrolled students *applied* to significantly more open-admission colleges than the non-concurrently enrolled high school students.

Additional ANOVAs did not reveal significant differences between groups at any other levels of college entrance difficulty. Furthermore, combining the Huskins and non-Huskins dually enrolled students did not result in significant differences.

Summary

There were no significant differences in the cognitive college readiness of concurrent enrollment participants at MCC and comparable college-bound high school students who did not participate in a concurrent enrollment program. Although the percentage of recently-graduated non-concurrently enrolled high school students who were not admitted into college (20.8%) was higher than the percentage of non-admitted students from each concurrent enrollment group (see Table 4.8), small sample sizes precluded the use of inferential tests to determine whether this difference achieved significance. Furthermore, there were no significant differences between any groups in acceptance rates into colleges at any of the higher levels of entrance difficulty. The non-Huskins dually enrolled students were significantly more likely to be accepted into colleges at the lowest level of entrance difficulty (open admission) than students in the high school comparison group (see Table 4.10), but this result does not indicate that the non-Huskins dually enrolled students had a lower level of cognitive college readiness.

Research Question Four

The fourth research question asked whether there were differences in *non-cognitive* college readiness between concurrent enrollment participants at MCC and comparable college-bound high school students who did not participate in a concurrent enrollment program. To answer this question, the concurrent enrollment groups were compared with the non-concurrently enrolled high school comparison group on posttest scores of the five non-cognitive variables measured by the College Survival and Success Scale (Liptak, 2006). These variables were commitment to education, self- and resource-management skills, interpersonal and social skills, academic success skills, and career planning skills. ANOVAs and post hoc tests were conducted to detect whether the differences between these groups were statistically significant.

Commitment to Education

Descriptive Statistics

Commitment to education involves being a lifelong learner and having knowledge of how education provides important skills and improves employability and earning potential. Posttest levels of commitment to education are presented in Table 4.11. The non-Huskins dually enrolled students had the highest posttest score in commitment to education ($M = 45.0$), followed by the early college high school students ($M = 43.2$), the Huskins students ($M = 42.5$), and the non-concurrently enrolled high school comparison students ($M = 40.9$).

The Results of the ANOVAs and Post Hoc Tests

A one-way ANOVA indicated that there were statistically significant differences between groups in posttest commitment to education, $F(3, 104) = 2.76$, $p = .05$. The

Table 4.11

Commitment to Education (Posttest): Descriptive Statistics

Group	*n*	Mean Score	*SD*
Huskins	39	42.5	4.0
Non-Huskins dual enrolled	9	45.0	3.0
Early college high school	29	43.2	3.2
High school comparison group	31	40.9	5.4
Total	108	42.4	4.3

Note. Group sample sizes were smaller for the non-cognitive college readiness variables than for the cognitive college readiness variables because non-cognitive readiness was assessed at the end of the spring semester. Several concurrently enrolled high school students who took college transfer courses at MCC in the fall 2008 semester did not take courses in the spring 2009 semester, and thus were unavailable to take the posttest of the College Survival and Success Scale.

effect size was medium (partial $\eta^2 = .07$). Post hoc comparisons (see Table 4.12) using the Fisher's least significant difference (LSD) test revealed that posttest commitment to education was significantly higher in the non-Huskins dually enrolled students ($M = 45.0$, $SD = 3.0$) than in the non-concurrently enrolled high school students ($M = 40.9$, $SD = 5.4$). In addition, posttest commitment to education was significantly higher in the early college high school students ($M = 43.2$, $SD = 3.2$) than in the non-concurrently enrolled high school students ($M = 40.9$, $SD = 5.4$).

As with the analyses of cognitive college readiness, there was concern that the small sample size of the non-Huskins dually enrolled students ($n = 9$) might have compromised the power to detect significant differences in the non-cognitive college readiness variables. Therefore, an additional one-way ANOVA on posttest commitment to education was conducted combining the non-Huskins dually-enrolled group with the Huskins group. However, when groups were combined, there were no significant differences in commitment to education.

Self- and Resource-Management Skills

Descriptive Statistics

Self- and resource-management skills involve knowledge of how to successfully manage time and money. Posttest levels of self- and resource-management skills are presented in Table 4.13. The non-Huskins dually enrolled students had the highest posttest score in self- and resource-management ($M = 40.0$), followed by the Huskins students ($M = 38.9$), the non-concurrently enrolled high school students ($M = 36.5$), and the early college high school students ($M = 35.8$).

Table 4.12

Commitment to Education (Posttest):

Results of Post Hoc Tests Related to Research Question Four

Group Comparisons[a]	Mean Difference	*SE*	*p*
Non-Huskins dual enrolled vs.			
high school comparison group	4.10	1.60	.01
Early college high school vs.			
high school comparison group	2.27	1.09	.04

Note. Alpha level = .05.

[a]In each group comparison, the group listed first had significantly higher posttest commitment to education than the group listed second.

Table 4.13

Self- and Resource-Management Skills (Posttest): Descriptive Statistics

Group	*n*	Mean Score	*SD*
Huskins	39	38.9	5.0
Non-Huskins dual enrolled	9	40.0	4.6
Early college high school	29	35.8	4.7
High school comparison group	31	36.5	6.6
Total	108	37.5	5.5

Note. Group sample sizes were smaller for the non-cognitive college readiness variables than for the cognitive college readiness variables because non-cognitive readiness was assessed at the end of the spring semester. Several concurrently enrolled high school students who took college transfer courses at MCC in the fall 2008 semester did not take courses in the spring 2009 semester, and thus were unavailable to take the posttest of the College Survival and Success Scale.

The Results of the ANOVAs and Post Hoc Tests

When the Huskins and non-Huskins dually enrolled groups were combined, an ANOVA indicated that there were significant differences in posttest self- and resource-management skills, $F(2, 105) = 4.05$, $p = .02$. The effect size was medium (partial $\eta^2 = .07$). Post hoc comparisons (see Table 4.14) using the Fisher's least significant difference (LSD) test revealed that posttest self- and resource-management skills were significantly higher in the combined group ($M = 39.1$, $SD = 4.9$) than in the non-concurrently enrolled high school comparison group ($M = 36.5$, $SD = 6.6$).

Interpersonal and Social Skills

Descriptive Statistics

Interpersonal and social skills involve knowledge of how to interact effectively with other students and professors. Posttest levels of interpersonal and social skills are presented in Table 4.15. The early college high school students had the highest posttest score in interpersonal and social skills ($M = 41.4$), followed by the non-Huskins dually enrolled students ($M = 41.0$), the Huskins students ($M = 40.8$), and the non-concurrently enrolled college-bound high school students ($M = 39.8$).

The Results of ANOVAs

Two ANOVAs were conducted. The first compared the posttest interpersonal and social skills of the four original groups of high school students. The second combined the Huskins and non-Huskins dually enrolled students into a single group. No significant differences between groups were found in either ANOVA.

Table 4.14

Self- and Resource-Management Skills (Posttest):

Results of Post Hoc Tests Related to Research Question Four

Group Comparisons[a]	Mean Difference	*SE*	*p*
Combined group vs. high school comparison[a]	2.57	1.24	.04

Note. Alpha level = .05.

[a]The combined group, which consisted of Huskins and non-Huskins dually enrolled students pooled together into a single group (n = 52), had significantly higher posttest self- and resource-management skills than the non-concurrently enrolled high school comparison group.

Table 4.15

Interpersonal and Social Skills (Posttest): Descriptive Statistics

Group	*n*	Mean Score	*SD*
Huskins	39	40.8	4.6
Non-Huskins dual enrolled	9	41.0	4.6
Early college high school	29	41.4	5.1
High school comparison group	31	39.8	5.6
Total	108	40.7	5.0

Note. Group sample sizes were smaller for the non-cognitive college readiness variables than for the cognitive college readiness variables because non-cognitive readiness was assessed at the end of the spring semester. Several concurrently enrolled high school students who took college transfer courses at MCC in the fall 2008 semester did not take courses in the spring 2009 semester, and thus were unavailable to take the posttest of the College Survival and Success Scale.

Academic Success Skills

Descriptive Statistics

Academic success skills include effectiveness at reading, studying, taking notes, and doing research. Posttest levels of academic success skills are presented in Table 4.16. The non-Huskins dually enrolled students had the highest posttest score in academic success skills ($M = 39.7$), followed by the Huskins students ($M = 36.9$), the early college high school students ($M = 36.1$), and the non-concurrently enrolled high school students ($M = 34.9$).

The Results of ANOVAs

Two ANOVAs were conducted. The first compared the academic success skills of the four original groups of high school students. The second combined the Huskins and non-Huskins dually enrolled students into a single group. No significant differences between groups were found in either ANOVA.

Career Planning Skills

Descriptive Statistics

Career planning skills involve knowledge about career options, and about which careers match personal skills and interests. Posttest levels of career planning skills are presented in Table 4.17. The non-Huskins dually enrolled students had the highest posttest score in career planning skills ($M = 40.3$), followed by the Huskins students ($M = 39.9$), the early college high school students ($M = 39.4$), and the non-concurrently enrolled high school students ($M = 35.3$).

Table 4.16

Academic Success Skills (Posttest): Descriptive Statistics

Group	*n*	Mean Score	*SD*
Huskins	39	36.9	6.1
Non-Huskins dual enrolled	9	39.7	6.2
Early college high school	29	36.1	6.9
High school comparison group	31	34.9	7.3
Total	108	36.4	6.7

Note. Group sample sizes were smaller for the non-cognitive college readiness variables than for the cognitive college readiness variables because non-cognitive readiness was assessed at the end of the spring semester. Several concurrently enrolled high school students who took college transfer courses at MCC in the fall 2008 semester did not take courses in the spring 2009 semester, and thus were unavailable to take the posttest of the College Survival and Success Scale.

Table 4.17

Career Planning Skills (Posttest): Descriptive Statistics

Group	*n*	Mean Score	*SD*
Huskins	39	39.9	5.9
Non-Huskins dual enrolled	9	40.3	3.9
Early college high school	29	39.4	5.7
High school comparison group	31	35.3	8.3
Total	108	38.5	6.8

Note. Group sample sizes were smaller for the non-cognitive college readiness variables than for the cognitive college readiness variables because non-cognitive readiness was assessed at the end of the spring semester. Several concurrently enrolled high school students who took college transfer courses at MCC in the fall 2008 semester did not take courses in the spring 2009 semester, and thus were unavailable to take the posttest of the College Survival and Success Scale.

The Results of the ANOVAs and Post Hoc Tests

A one-way ANOVA indicated that there were statistically significant differences between groups in posttest career planning skills, $F(3, 104) = 3.42$, $p = .02$. The effect size was medium (partial $\eta^2 = .09$). Post hoc comparisons (see Table 4.18) using the Fisher's least significant difference (LSD) test revealed that all three of the concurrent enrollment groups had significantly higher career planning skills than the non-concurrently enrolled high school comparison group ($M = 35.3$, $SD = 8.3$).

When the Huskins and non-Huskins dually enrolled groups were combined, a second ANOVA indicated that there were still statistically significant differences in career planning skills, $F(2, 105) = 5.15$, $p = .007$. The effect size was medium (partial $\eta^2 = .09$). Post hoc comparisons using the Fisher's least significant difference (LSD) test revealed that posttest career planning skills were significantly higher for the combined group ($M = 40.0$, $SD = 5.6$) than for the non-concurrently enrolled high school comparison group ($M = 35.3$, $SD = 8.3$).

Summary

The fourth research question asked whether there were differences in non-cognitive college readiness between concurrently enrolled students at MCC and comparable college-bound high school students who did participate in a concurrent enrollment program. Significant differences were detected for three non-cognitive variables. Post hoc tests revealed that the non-Huskins dually enrolled students and the early college high school students displayed a significantly higher level of commitment to education at posttest than the non-concurrently enrolled high school students (see Table 4.12). In addition, when the Huskins and non-Huskins dually enrolled students were

Table 4.18

Career Planning Skills (Posttest):

Results of Post Hoc Tests Related to Research Question Four

Group Comparisons[a]	Mean Difference	*SE*	*p*
Huskins vs. high school comparison group	4.55	1.57	.005
Non-Huskins dual enrolled vs. high school comparison group	5.01	2.48	.046
Early college high school vs, high school comparison group	4.06	1.69	.018
Combined group[b] vs. high school comparison	4.64	1.50	.003

Note. Alpha level = .05.

[a]In each group comparison, the group listed first had significantly higher posttest career planning skills than the group listed second.

[b]The combined group (n = 52) consisted of Huskins and non-Huskins dually enrolled students pooled together into a single group.

combined, they displayed a significantly higher level of self- and resource management at posttest than the non-concurrently enrolled high school students (see Table 4.14). Finally, all three concurrent enrollment groups displayed a significantly higher level of career planning skills at posttest than the non-concurrently enrolled high school comparison group (see Table 4.18). The non-concurrently enrolled high school comparison group never displayed a significantly higher level of non-cognitive college readiness than any of the concurrent enrollment groups on any variable.

Research Question Five

The fifth research question asked whether there were differences in the *non-cognitive* college readiness of participants in the different types of concurrent enrollment programs at MCC. To answer this question, posttest scores of the five non-cognitive variables measured by the College Survival and Success Scale (Liptak, 2006) were compared between the three concurrent enrollment groups. ANOVAs and post hoc tests were conducted to detect whether the differences between these groups were statistically significant. Because descriptive statistics on commitment to education, self- and resource-management skills, interpersonal and social skills, academic success skills, and career planning skills are presented in the previous section addressing research question four (see Tables 4.11, 4.13., 4.15, 4.16, and 4.17), only the results of ANOVAs and post hoc tests are presented in this section.

The Results of the ANOVAs and Post Hoc Tests

The only non-cognitive college readiness variable in which significant differences between concurrent enrollment groups was revealed was self- and resource-management skills. A one-way ANOVA indicated that there were statistically significant differences

between groups in posttest self- and resource-management skills, $F(3, 104) = 2.79$, $p = .04$. The effect size was medium (partial $\eta^2 = .08$). Post hoc comparisons (see Table 4.19) using the Fisher's least significant difference (LSD) test revealed that posttest self- and resource-management skills were significantly higher in Huskins students ($M = 38.9$, $SD = 5.0$) than in early college high school students ($M = 35.8$, $SD = 4.7$). In addition, posttest self- and resource-management skills were significantly higher in non-Huskins dually enrolled students ($M = 40.0$, $SD = 4.6$) than in early college high school students ($M = 35.8$, $SD = 4.7$).

When the Huskins and non-Huskins dually enrolled groups were combined, an ANOVA indicated that there were significant differences in posttest self- and resource-management skills, $F(2, 105) = 4.05$, $p = .02$). The effect size was medium (partial $\eta^2 = .07$). Post hoc comparisons (see Table 4.19) using the Fisher's least significant difference (LSD) test revealed that posttest self- and resource-management skills were significantly higher in the combined group ($M = 39.1$, $SD = 4.9$) than in the early college high school group ($M = 35.8$, $SD = 4.7$).

Summary

There were significant differences between concurrent enrollment programs at MCC for only one non-cognitive college readiness variable. The posttest self- and resource management skills of the Huskins and non-Huskins dually enrolled students were significantly higher than the posttest self- and resource management skills of the early college high school students.

Table 4.19

Self- and Resource-Management Skills (Posttest):

Results of Post Hoc Tests Related to Research Question Five

Group Comparisons[a]	Mean Difference	*SE*	*p*
Huskins vs. early college high school	3.08	1.32	.02
Non-Huskins dual enrolled vs. early college	4.21	2.06	.04
Combined group[b] vs. early college	3.29	1.27	.01

Note. Alpha level = .05.

[a]In each group comparison, the group listed first had significantly higher posttest self- and resource-management skills than the group listed second.

[b]The combined group (n = 52) consisted of Huskins and non-Huskins dually enrolled students pooled together into a single group.

Research Question Six

The sixth research question asked whether previously-detected effects were still evident after controlling for pre-existing student characteristics that may have had an impact on cognitive and non-cognitive college readiness. To answer this question, ANCOVAs using pre-existing student characteristics as control variables were conducted for each ANOVA that indicated a significant difference in college readiness. The results of these ANCOVAs are presented separately for each relevant college readiness variable. Because not all of the fourteen pre-existing student characteristics assessed in this study were used for each ANCOVA, the control variables are listed separately in each section.

The Results of ANCOVAs Related to Grades of C or Better

Prior ANOVAs revealed significant differences between groups in the probability of Cs or better in college transfer courses. The Huskins group had a significantly higher probability of Cs or better than the regularly matriculated college comparison group or the early college high school group. In addition, when Huskins students and non-Huskins dually enrolled students were combined into a single group, the combined group had a significantly higher probability of Cs or better than the regularly matriculated college comparison group or the early college high school group. Therefore, an ANCOVA was conducted to assess whether these group differences remained significant after controlling for effects of age, ethnicity, gender, completion of college transfer courses prior to the onset of the study, completion of developmental education courses, reading ability, sentence skills ability, arithmetic ability, and algebra ability. Pretest levels of the five non-cognitive college readiness variables were not included in the ANCOVA because this information was not obtained for the regularly matriculated college students.

Even after controlling for the effects of the nine pre-existing student characteristics, significant differences in the probability of earning Cs or better were detected, $F(3, 93) = 3.34$, $p = .02$. Furthermore, there was a medium effect size (partial $\eta^2 = .10$). Pairwise comparisons (see Table 4.20) revealed that after controlling for the effects of the covariates, the higher probability of Huskins students earning Cs or better (adjusted mean = .98, *SE* = .05) than regularly matriculated college students (adjusted mean = .67, *SE* = .07) remained significant, whereas the higher probability of Huskins students earning Cs or better than early college high school students lost significance. Controlling for covariates also revealed a new significant difference in the probability of earning Cs or better. After the effects of pre-existing student characteristics were accounted for in an ANCOVA, the non-Huskins dually enrolled students were significantly more likely earn Cs or better (adjusted mean = .94, *SE* = .08) than the regularly matriculated college students (adjusted mean = .67, *SE* = .07).

An additional ANCOVA on grades of C or better combining the non-Huskins dual enrollment group with the Huskins group was also significant, $F(2, 94) = 4.92$, $p = .01$, with a medium effect size (partial $\eta^2 = .10$). Pairwise comparisons (see Table 4.20) revealed that after controlling for pre-existing student characteristics, the probability of Cs or better was significantly higher for the combined group (adjusted mean = .97, *SE* =.05) than for the regularly matriculated college group (adjusted mean = .67, *SE* = .07).

The Results of ANCOVAs Related to Commitment to Education

A prior ANOVA revealed significant differences between groups in posttest commitment to education. The non-Huskins dual enrollment group and the early college high school group had significantly higher commitment to education than the non-

Table 4.20

Probability of Cs or Better:

Results of Pairwise Comparisons in ANCOVAs

Group Comparisons[a]	Mean Difference	*SE*	*p*
Huskins vs.regularly matriculated	.32	.10	.003
Non-Huskins dual enrolled vs. regularly matriculated	.27	.11	.018
Combined group[b] vs. regularly matriculated	.30	.10	.003

Note. Alpha level = .05.

[a]In each group comparison, the group listed first had a significantly higher probability of making a C or better than the group listed second.

[b]The combined group (n = 52) consisted of Huskins and non-Huskins dually enrolled students pooled together into a single group.

concurrently enrolled high school comparison group. Therefore, an ANCOVA was conducted to assess whether these group differences remained significant after controlling for effects of age, ethnicity, gender, and pretest levels of the five non-cognitive college readiness variables. The other six control variables (completion of college transfer courses prior to the onset of the study, completion of developmental education courses, reading ability, sentence skills ability, arithmetic ability, and algebra ability) were not included in the ANCOVA because this information was not obtained for the non-concurrently enrolled high school comparison group. No significant differences were detected by this ANCOVA.

The Results of ANCOVAs Related to Self- and Resource-Management

Prior ANOVAs revealed significant differences between groups in posttest self- and resource-management skills. The Huskins group and the non-Huskins dual enrollment group both had significantly higher self- and resource-management skills than the early college high school group. Furthermore, the combined group of Huskins and non-Huskins dually enrolled students had significantly higher self- and resource-management skills than either the early college high school group or the non-concurrently enrolled high school comparison group. Therefore, an ANCOVA was conducted to assess whether group differences in self- and resource-management skills remained significant after controlling for effects of age, ethnicity, gender, and the five non-cognitive college readiness variables at pretest. An additional ANCOVA was conducted including the combined Huskins and non-Huskins dual enrollment group.

Although no significant differences were found in the first ANCOVA, the combined-group ANCOVA was significant, $F(2, 97) = 3.24$, $p = .04$, with a medium

effect size (partial $\eta^2 = .06$). Pairwise comparisons (see Table 4.21) revealed that after controlling for the effects of the covariates, the higher self- and resource management skills of the combined group (adjusted mean = 38.4, *SE* = .64) compared to the non-concurrently enrolled high school comparison group (adjusted mean = 35.8, *SE* =.82) remained significant, whereas the higher self- and resource-management skills of the combined group compared to the early college high school group lost significance.

The Results of ANCOVAs Related to Career Planning Skills

Prior ANOVAs revealed significant differences between groups in posttest career planning skills. The Huskins group, the non-Huskins dual enrollment group, and the early college high school group all had significantly higher career planning skills than the non-concurrently enrolled high school comparison group. Furthermore, the combined group of Huskins and non-Huskins dually enrolled students had significantly higher career planning skills than the non-concurrently enrolled high school comparison group. Therefore, ANCOVAs were conducted to assess whether group differences in career planning skills remained significant after controlling for effects of age, ethnicity, gender, and the five non-cognitive college readiness variables at pretest. An additional ANCOVA was conducted including the combined Huskins and non-Huskins dual enrollment group.

Even after controlling for the effects of the eight pre-existing student characteristics, significant differences in career planning skills were detected, $F(3, 96) = 5.24$, $p = .002$. Furthermore, there was a large effect size (partial $\eta^2 = .14$). Pairwise comparisons (see Table 4.22) revealed that after controlling for the effects of the covariates, the higher level of career planning skills of Huskins students (adjusted mean = 39.6, *SE* = 0.73) and non-Huskins dually enrolled students (adjusted mean = 42.2,

Table 4.21

Self- and Resource-Management Skills (Posttest):

Results of Pairwise Comparisons in ANCOVAs

Group Comparisons[a]	Mean Difference	*SE*	*p*
Combined group[b] vs. high school comparison	2.61	1.03	.01

Note. Alpha level = .05.

[a]In each group comparison, the group listed first had a significantly higher probability of making a C or better than the group listed second.

[b]The combined group (n = 52) consisted of Huskins and non-Huskins dually enrolled students pooled together into a single group.

Table 4.22

Career Planning Skills (Posttest):

Results of Pairwise Comparisons in ANCOVAs

Group Comparisons[a]	Mean Difference	*SE*	*p*
Huskins vs. high school comparison group	3.48	1.11	.002
Non-Huskins dually enrolled vs. high school comparison group	6.12	1.79	.001
Combined group[b] vs. high school comparison	3.91	1.08	.000

Note. Alpha level = .05.

[a]In each group comparison, the group listed first had a significantly higher probability of making a C or better than the group listed second.

[b]The combined group (n = 52) consisted of Huskins and non-Huskins dually enrolled students pooled together into a single group.

SE = 1.59) compared to non-concurrently enrolled high school students (adjusted mean = 36.1, *SE* = 0.86) remained significant. However, the higher level of career planning skills of early college high school students compared to non-concurrently enrolled high school students lost significance.

An additional ANCOVA combining Huskins and non-Huskins students also detected significant differences in career planning skills, $F(2, 97) = 6.58$, $p = .002$. There was a medium-to-large effect size (partial $\eta^2 = .12$). Pairwise comparisons (see Table 4.22) revealed that after controlling for the effects of the covariates, the combined group (adjusted mean = 40.0, *SE* = .68) had significantly higher career planning skills than the high school comparison group (adjusted mean = .36.1, *SE* = 0.86).

Summary

The sixth research question asked whether the effects revealed by ANOVAs were still evident after controlling for pre-existing student characteristics that may have had an impact on college readiness. ANCOVAs controlling for pre-existing student characteristics revealed the following seven effects:

- The higher probability of the Huskins group earning Cs or better than the regularly matriculated college comparison group remained statistically significant,
- The higher probability of the non-Huskins dual enrollment group earning Cs or better than the regularly matriculated college comparison group *gained* statistical significance,
- The higher probability of the combined group of Huskins and non-Huskins dually enrolled students earning Cs or better than the regularly matriculated college comparison group remained significant,

- The higher posttest level of self- and resource-management skills in the combined group than in the non-concurrently enrolled high school comparison group remained significant,
- The higher posttest level of career planning skills in the Huskins group than in the non-concurrently enrolled high school comparison group remained significant,
- The higher posttest level of career planning skills in the non-Huskins dually enrolled group than in the non-concurrently enrolled high school comparison group remained significant, and
- The higher posttest level of career planning skills in the combined group than in the non-concurrently enrolled high school comparison group remained significant.

Research Question Seven

The seventh research question was "What are the perceptions of concurrently enrolled high school students regarding their experiences?" This question was answered by asking a small group of concurrently enrolled students questions about the impact that their concurrent enrollment experiences had on them, and then interpreting their responses through the use of thematic analysis. Three Huskins students, three non-Huskins dually enrolled students, and three early college high school students were randomly selected to answer four open-ended questions in individual interviews (see Appendix F). Themes were considered to be significant if they were expressed by at least four of the nine interviewees (44%). Seven significant themes emerged (see Table 4.23). Themes were coded as "moderately strong" if they were expressed by four, five, or six interviewees (44 to 67%). Themes were coded as "very strong" if they were expressed by seven or more interviewees (78 to 100%).

Table 4.23

Emergent Themes

Theme	Source	Prevalence
Academic success requires more effort in college	1st question	44% (ms)[a]
Students must be more self-motivated in college	1st question	44% (ms)
Concurrent enrollment enhanced my college readiness	2nd question	100% (vs)[b]
Concurrent enrollment taught me what to expect	2nd question	67% (ms)
Concurrent enrollment increased my desire for college	3rd question	56% (ms)
Concurrent enrollment confirmed that I can succeed	3rd question	56% (ms)
Concurrent enrollment at MCC was a good experience	4th question	78% (vs)

[a]ms = moderately strong.

[b]vs = very strong.

Themes Emerging from Question One

The first question interviewees were asked was "As a result of this concurrent enrollment experience, what did you learn about college that you didn't know before?". Two themes emerged from this question.

The first theme can be paraphrased as *"Academic success requires more effort in college than in high school."* One early college high school student said "With high school, I just kind of slid through real easy, but with college it was actually a lot more work." Another early college high school student said "I really learned that you have to take notes" and "…you have to study for tests a lot more." A Huskins student mentioned that there is more bookwork in college, while a non-Huskins dually enrolled student mentioned having to study a lot more in college than in high school. This moderately strong theme was expressed by four of the nine interviewees (44%), and was seen across all three types of concurrent enrollment.

The second theme can be paraphrased as *"Students must be more self-motivated in college than in high school."* As with the first theme, this theme was moderately strong. It was evident in 44% of interviews, across all three types of concurrent enrollment. An early college high school student said

> College teachers don't get on you about homework like high school teachers do. In high school, your teachers get on you about…like 'Why didn't you come to class?' In college, usually they just don't care. If you miss four days or something, they'll just drop you and it doesn't matter. So you have more responsibilities.

A Huskins student said "I learned that if you don't keep up with your assignments and know when your tests are, then you're not gonna do good." Other participants mentioned the need to pay one's own bills in college, and the need to meet with college advisors to plan class schedules.

Themes Emerging from Question Two

The second question interviewees were asked was "To what extent did this concurrent enrollment experience increase your college readiness? Please explain." Two themes emerged from this question.

The first theme was *"Concurrent enrollment enhanced my college readiness."* This theme was very strong. One hundred percent of the nine interviewees expressed the belief that their concurrent enrollment experiences enhanced their college readiness. None of the nine interviewees indicated that concurrent enrollment was ineffective or that it was a waste of time.

The other theme emerging from question two reflected a specific way in which interviewees believed concurrent enrollment enhanced their college readiness. This theme was *"Concurrent enrollment taught me what to expect from college."* Illustrating the notion that concurrent enrollment teaches students what to expect from college, a Huskins student said "I will know what the teachers and professors are going to be like." A non-Huskins dually-enrolled student said "When I come back next semester, I'll know what to expect. There won't be a culture shock or anything like that." The theme of concurrent enrollment creating a better idea of what to expect in college was moderately strong, occurring in six of the nine interviews (67%), across all three types of concurrent enrollment.

Themes Emerging from Question Three

The third question interviewees were asked was "To what extent did this concurrent enrollment experience contribute or take away from your desire for a college education? Please explain." Two themes emerged from this question.

A moderately strong theme related to question three was *"Concurrent enrollment increased my desire for college."* This theme was evident in five of the nine interviews (56%), and occurred across all three types of concurrent enrollment. Commenting on why concurrent enrollment increased his desire for college, an early college high school student said "I get to make up my schedule. I get to choose when I take classes, what day of the week, and all that. I love doing that!"

Another moderately strong theme was *"Concurrent enrollment confirmed that I can succeed in college."* A Huskins student expressed this view by saying

> Moving away from home and going somewhere is kind of scary to me. But I know being able to see what college is like here, near home, has helped me to see that it's not as bad as I thought.

Five of the nine interviewees (56%) alluded to this theme, including at least one participant from each of the three types of concurrent enrollment. Three of these five participants had also alluded to the first theme emerging from this question, indicating that there might be a connection between the confirmation of one's ability to succeed in college and an increased desire to attend college.

Themes Emerging from Question Four

The fourth question interviewees were asked was "Do you have any comments or questions that this concurrent enrollment experience has brought up?" One theme

emerged from this question. This theme can be paraphrased as *"Concurrent enrollment at MCC was a good experience."* Expressed in seven of the nine interviews (78%), this theme was very strong. All three Huskins students, all three early college high school students, and one non-Huskins dually enrolled student indicated that they had a positive experience with concurrent enrollment at MCC. Furthermore, although the remaining two interviewees did not indicate that their concurrent enrollment experiences were positive, none of the interviewees indicated that their concurrent enrollment experiences were negative.

Summary

The seventh research question, which asked how high school students perceive their concurrent enrollment experiences at MCC, was addressed by the thematic analyses of interview data. The following seven themes emerged.

1. Academic success requires more effort in college than in high school,
2. Students must be more self-motivated in college than in high school,
3. Concurrent enrollment enhanced my college readiness,
4. Concurrent enrollment taught me what to expect from college,
5. Concurrent enrollment increased my desire for college,
6. Concurrent enrollment confirmed that I can succeed, and
7. Concurrent enrollment at MCC was a good experience.

The third and seventh themes were classified as very strong, and the other five were classified as moderately strong. Overall, the nine interviewees seemed to be satisfied with their concurrent enrollment experiences.

Conclusions

At Mitchell Community College, concurrent enrollment programs were found to be associated with levels of cognitive and non-cognitive college readiness that were either comparable to or significantly higher than the levels found in the both of the two comparison groups. The regularly matriculated college comparison group and the non-concurrently enrolled high school comparison group never displayed significantly higher outcomes than any of the concurrent enrollment groups for any variable. Furthermore, there was evidence that some types of concurrent enrollment were associated with better outcomes than others. For example, the Huskins students had a significantly higher probability of earning Cs or better in college transfer courses than the early college high school students, and the Huskins and non-Huskins dually enrolled students displayed significantly higher posttest levels of self- and resource-management skills than the early college high school students. While the higher performance of the Huskins and non-Huskins students compared to the early college high school students always lost significance after accounting for the effects of pre-existing student characteristics in ANCOVAs, the higher performance of the concurrently enrolled groups compared to the comparison groups often remained significant in the ANCOVAs. Several themes emerged from the analysis of interview data, all of which seemed to indicate that the students perceived their concurrent enrollment experiences in a positive manner.

CHAPTER 5: DISCUSSION

The discussion of the results of a research project requires more than just an interpretation of the results of statistical tests. In order to truly comprehend the results of a major research project and their implications, it is necessary to reconsider the study's problem, purpose, significance, and method. Therefore, this chapter begins by briefly summarizing the study. This section is followed with a detailed interpretation of the results. Recommendations for future research are then presented. The chapter concludes with a summary of the major insights gained from the study.

Summary of the Study

Statement of the Problem

Concurrent enrollment is believed to have the potential to increase college readiness and admission rates (American Institutes for Research & SRI International, 2007; Bailey & Karp, 2003; Early College High School Initiative, 2007; Karp & Hughes, 2008; Kim, 2006; Mitchell Community College, 2007; North Carolina New Schools Project, 2008; Richardson, 1999; Swanson, 2007). Although there is an abundance of evidence supporting the need to increase the percentage of the American citizenry who successfully complete college degrees and certificates (Autor et al., 2008; Carnevale & Desrochers, 2001; Dohn & Shniper, 2007; Kodrzycki, 2002; Levin, 2005; Levin, 2009; McCabe, 2003; McCabe & Day, 1998), there is a need for more systematic assessment of

the relationship between concurrent enrollment programs and enhanced cognitive and non-cognitive college readiness. This study explores this relationship.

Purpose

The purpose of this study was to systematically investigate the cognitive and non-cognitive college readiness of students who participated in concurrent enrollment programs at a North Carolina community college, while controlling for the effects of pre-existing student characteristics.

Significance

This study is significant because it is one of very few studies comparing outcomes between different types of concurrent enrollment. Furthermore, the small number of comparative studies that do exist seem to focus exclusively on the effects of instructor credentials (Hebert, 2001; Hobbs, 2008) or the effects of course location (Burns & Lewis, 2000; Smith, 2008; Smith, 2007). There is very little research comparing outcomes between a dual credit program (Huskins), a college-credit only program (non-Huskins dual enrollment), and an early college high school program.

This study is also significant because it is one of the first to investigate the relationship between concurrent enrollment and non-cognitive college readiness. As discussed in the literature review, there is ample research showing that college success is affected by variables such as commitment, self- and resource-management skills, interpersonal and social skills, academic success skills, and having an informed career plan. However, this is one of the few studies to assess the effects of concurrent enrollment programs on these non-cognitive college readiness variables.

A third reason this study is significant is because it is one of a small number of attempts to examine the effects of concurrent enrollment programs while controlling for pre-existing student characteristics. There is plenty of data indicating that concurrent enrollment is associated with a variety of positive academic outcomes (Andrews, 2004; Chmelysnki, 2004; Finch, 1997; Hanson, 2000; Hebert, 2001; Hughes, Karp, Fermin, et al., 2005; Koszoru, 2005; Marshall & Andrews, 2002; Monroe Community College, 2003; North Carolina New Schools Project, 2009c; Webb, 2009). However, only eight studies were located that controlled for pre-existing student characteristics (Chatman & Smith, 1998; Eimers & Mullen, 2003; Karp, Calcagno, et al., 2008; Kim, 2006; Nitzke, 2002; O'Brien & Nelson, 2004; Richardson, 1999; Spurling & Gabriner, 2002). This study controls for the effects of fourteen pre-existing student characteristics, which is more than any of the eight controlled studies described in the literature review.

Method

Data were collected in the fall and spring semester of the 2008-09 academic year at Mitchell Community College (MCC) and in three local high schools. Five groups were involved. The treatment groups included Huskins dual credit students, non-Huskins dually enrolled students, and early college high school students at the Collaborative College of Technology and Leadership (CCTL). The two comparison groups included regularly matriculated college classmates of concurrently enrolled students and non-concurrently enrolled high school students with GPAs of at least 2.50 participating in college-preparatory high school curriculums. The total sample included 169 students.

In order to assess cognitive college readiness, the probability of grades of C or better in college transfer classes was obtained. Cognitive college readiness was also

assessed by obtaining the frequencies of acceptance and admission into colleges of various degrees of entrance difficulty. Non-cognitive college readiness was obtained by administering the College Survival and Success Scale (Liptak, 2006), which assessed levels of commitment to education, self- and resource-management skills, interpersonal and social skills, academic success skills, and career planning skills. Differences between groups in cognitive and non-cognitive college readiness were analyzed statistically, both before and after controlling for the effects of pre-existing student characteristics. In addition, qualitative data on perceptions of concurrent enrollment experiences were obtained through nine interviews with concurrently enrolled students.

Interpretation of the Results

The interpretation of the results pertaining to the two cognitive college readiness variables is presented first. Then the results pertaining to the five non-cognitive college readiness variables are interpreted. Finally, the results pertaining to interview data on student perceptions of concurrent enrollment are presented.

Cognitive College Readiness

Cognitive college readiness was measured in two ways. First, data were collected on the percentages of students in each group who made transferable grades of C or better in college transfer courses. Second, data were collected on the frequencies of colleges of various degrees of entrance difficulty into which recently graduated high school seniors were accepted and/or admitted. Being accepted into colleges at higher degrees of entrance difficulty was viewed as an indicator of cognitive college readiness.

Probability of Grades of C or Better

Significant differences between the Huskins group, the non-Huskins dual enrollment group, the early college high school group, and the regularly matriculated college comparison group were detected through the use of ANOVAs and ANCOVAs. The effects of age, ethnicity, gender, prior completion of college transfer courses, completion of developmental education courses, reading ability, sentence skills ability, arithmetic ability, and algebra ability were controlled for in the ANCOVAs.

The performance of Huskins students. The Huskins students had a significantly higher probability of making Cs or better in college transfer courses than their regularly matriculated college classmates. The higher performance of the Huskins students compared to the regularly matriculated college students remained significant even after controlling for the effects of age, ethnicity, gender, completion of college transfer courses prior to the onset of the study, completion of developmental education courses, reading ability, sentence skills ability, arithmetic ability, and algebra ability in an ANCOVA. The Huskins students also had a significantly higher probability of making Cs or better than the early college high school students. However, the higher performance of the Huskins students compared to the early college high school students lost significance after accounting for the effects of pre-existing student characteristics.

The fact that students in the Huskins program had a higher probability of making Cs or better than the regularly matriculated community college students, even after controlling for the effects of nine pre-existing student characteristics, supports that possibility that participation in the Mitchell Community College Huskins program had a positive effect on grades in college transfer courses. This is perhaps an example of the

Hawthorne Effect, which can be defined as outcomes that are due the subjects' awareness of the extra attention they are receiving due to their participation in an experiment (Merrett, 2006). At Mitchell Community College (MCC), Huskins students take special sections of college transfer courses in which they receive registration priority (Gray, 2005), and the importance of self-direction and effort to college success are stressed to them prior to the first day of class in required orientation meetings (Mitchell Community College, 2007; Tara Cashion, MCC Coordinator of Secondary/Postsecondary Programs, personal communication, February 5, 2010). In addition, at MCC, Huskins students do not have to pay tuition. Due to these unique qualities, Huskins participants may perceive that they are participating in a sort of educational experiment, and that their successes and failures are thus being closely monitored. This perception may have contributed to the extra effort necessary to make a higher percentage of Cs or better than their regularly matriculated college classmates.

The higher probability of Cs or better in Huskins students may have also been influenced by the perception that they were receiving a unique opportunity that they needed to take seriously. The majority of Mitchell Community College students do not receive registration priority or tuition wavers. Only Huskins students receive both of these advantages. In an effort to capitulate on these special privileges, the Huskins students may have put extra effort into making good grades.

However, the significantly higher probability of Cs or better in Huskins students compared to regularly matriculated college students in the ANCOVA does not prove that participation in the Huskins program is what caused the difference. It is also possible that unexamined variables had an impact. One such unexamined variable might have been

high school academic achievement, as measured by GPA. The high school GPAs of participants were only available for the regularly matriculated college students, who had an average GPA of 2.69. Although the average GPA of the Huskins students was unknown, all high school students must have at least a 2.50 GPA to be eligible for the Huskins program at MCC (Mitchell Community College, 2007). Comparing the *average* GPA of the regularly matriculated college students to the *minimum* GPA of the Huskins students reveals the likelihood that the Huskins students had better grades in high school. Therefore, the higher percentage of Cs or better in Huskins students versus regularly matriculated students may have nothing to do with the effects of the Huskins program, but rather may be the result of higher levels of high school academic achievement in the Huskins students.

Because significance disappeared in an ANCOVA, the higher probability of Cs or better in Huskins students versus early college high school students is likely due to differences in pre-existing student characteristics rather than the effects of concurrent enrollment. ACCUPLACER placement test scores in reading ability, sentence skills ability, arithmetic ability, and algebra ability seem to indicate that the Huskins students had a higher level of pre-existing academic ability than the early college high school students. The Huskins students scored the second-highest on all four placement tests (behind the non-Huskins dually enrolled students), while the early college high school students scored the lowest.

Another pre-existing student characteristic that may have had an impact on the higher performance of the Huskins group versus the early college high school group was ethnicity. The Huskins group had a smaller percentage of minority students (11.9%) than

the early college high school group (19.4%). Educational disadvantages such as minority language status (National Center for Education Statistics, 1978; Rumberger & Larson, 1998), poverty and a lack of parental education (Bempechat & Ginsburg, 1989), and a lack of responsiveness from the educational system (Corson, 1993) may lead to a lack of academic readiness for some minority students. Perhaps these disadvantages contributed to the lower probability of Cs or better in the early college high school students included in this sample.

Finally, the experience and maturity that come with age may have contributed to the Huskins group's higher probability of Cs or better. The Huskins students who participated in this study were a little older (M = 16.8 years) than the early college high school students (M = 16.3 years). Whereas all other participants were at least sixteen, three of the early college high school students were only fifteen. The youth of the early college high school students may have put them at a disadvantage.

In addition to the control variables included in this study, several unexamined pre-existing student characteristics may have contributed to the higher probability of Cs or better for the Huskins group. First, the Huskins students probably had a higher level of academic achievement than the early college high school students. Only high school students with GPAs of at least 2.50 were allowed into the Huskins program, while early college high school students at the Collaborative College of Technology and Leadership (CCTL) can continue taking college courses as long as they have GPAs of at least 2.00 (Brooks, 2009; Mitchell Community College, 2007). Second, CCTL actively recruits students who are at risk for not going to college, students who may not be able to afford college, and first generation college-goers (Brooks, 2009). The disadvantages associated

with being "at-risk" may have had a negative impact on the college grades of the early college high school students.

The performance of non-Huskins dually enrolled students. After controlling for the effects of nine pre-existing student characteristics in an ANCOVA, the non-Huskins dually enrolled students had a significantly higher probability of making grades of C or better in college transfer courses than their regularly matriculated college classmates. This effect was *not* significant in a one-way ANOVA that did not control for pre-existing student characteristics.

Compared to the Huskins program, there is less support for the notion that after accounting for the effects of the control variables, the significantly higher probability of non-Huskins dually enrolled students making Cs or better than regularly matriculated college students might have been due to the effects of participation in the program. The non-Huskins dual enrollment program at MCC is not highly structured. Unlike the MCC Huskins program, it does not require students to attend an orientation meeting and it does not provide registration priority for college transfer classes set aside primarily for concurrently enrolled students. Rather, non-Huskins dually enrolled students sign up for college courses on a case-by-case basis (Mitchell Community College, 2007). However, there is one characteristic of the non-Huskins dual enrollment program that may have contributed to the higher college grades of participants in that program. Non-Huskins dually enrolled students at MCC do not have to pay tuition for their classes, whereas regularly matriculated college students do. The opportunity to take free college courses to get a "jump start" on a college education may have led to a higher level of motivation in the non-Huskins dually enrolled students.

It is also possible that unmeasured pre-existing student characteristics may have been partly responsible for the good grades of the non-Huskins dually enrolled students. For example, eight of the ten non-Huskins dually enrolled students in the sample were home-schooled, while none of the other concurrently enrolled students and only a small minority of the regularly matriculated college students were home schooled. Because the variance in whether or not students were home schooled was small and was only found in two of the five groups, this pre-existing student characteristic was not utilized as a control variable in the ANCOVA. However, it is possible that the home-schooling of the majority of the non-Huskins dually enrolled students may have had a positive impact on their probability of earning Cs or better. Perhaps the enhanced role of parents who home-school in the education of their children leads to more parental encouragement, more parental assistance, and more parental pressure to excel in college, ultimately resulting in higher college grades for home-schooled students.

Regardless of the causes, the fact that this and several other significant differences were found between the non-Huskins dual enrollment group and the other groups was intriguing. Considering that there were only ten participants the non-Huskins dual enrollment group, any differences between this group and others would need to be fairly robust in order to achieve statistical significance. Sample sizes this small often do not yield enough statistical power for significant differences to be detected.

Acceptance into Colleges of Various Degrees of Entrance Difficulty

In the fall of 2008, recently graduated high school seniors were asked to name the college into which they had been accepted, and to name the college into which they had been admitted. Three groups were included in this analysis: the Huskins group, the non-

Huskins dual enrollment group, and the non-concurrently enrolled college-bound high school comparison group. Petersons' *Guide to College: 2009* was used to code the level of entrance difficulty for each college. Although ANOVAs were conducted on college acceptance, no inferential analyses were conducted on college admissions due to the fact that sample sizes were too small to justify the use of the nonparametric analysis that would have been required for this nominal variable.

A very high majority of recently-graduated high school students in this study were accepted to at least one college (95.1%). Of the concurrently enrolled students, all but one Huskins student (97.3%) were accepted into college. All but two of the non-concurrently enrolled college-bound high school students (91.7%) were accepted into college. When these data are compared to the most recent state and national college attendance data, the college acceptance rates of the two concurrent enrollment groups and the non-concurrently enrolled high school comparison group appear to be far above average. Only 65.7% of recent high school graduates in North Carolina and 62.0% of recent high school graduates across the United States were attending degree-bearing postsecondary institutions in the fall of 2006 (Snyder, Dillow, & Hoffman, 2009).

No group was significantly more likely than any other to be accepted into colleges coded by Peterson's (2008) at higher levels of entrance difficulty (minimally difficult, moderately difficult, very difficult, or most difficult). Furthermore, a comparison of descriptive statistics shows that the overall college acceptance rates of the concurrent enrollment groups (97.3%) were only a little higher than the acceptance rates of the non-concurrently enrolled high school comparison group (91.7%). Therefore, the results of the statistical analyses did not provide evidence that concurrent enrollment is associated

with enhanced cognitive college readiness as measured by acceptance into colleges at higher levels of entrance difficulty.

However, the non-Huskins dually enrolled students were significantly more likely to be accepted into open admission, two-year colleges than either the Huskins group or the non-concurrently enrolled high school comparison group. Because the term *open admission* means that any student who applies is automatically accepted, the results indicate that significantly more non-Huskins dually enrolled students *applied* to open admission colleges than other students. Whereas participants in the other two groups gravitated towards colleges rated as moderately difficult, the non-Huskins dually enrolled students seemed to prefer two-year colleges.

It is difficult to speculate as to why the non-Huskins dually enrolled students were significantly more likely to apply to two-year colleges than the other two groups of recently graduated high school seniors. The reason does *not* appear to be a lack of cognitive college readiness. When cognitive college readiness was measured by the probability of earning Cs or better in college transfer courses, the non-Huskins dually enrolled students appeared to be ready for college. They earned Cs or better 90.0% of the time, more than either the regularly matriculated college students (80.6%) or the early college high school students (78.6%).

Perhaps the reason the non-Huskins dually enrolled students were significantly more likely to apply to two-year colleges than the Huskins or non-concurrently enrolled high school students has to do with the fact that eighty percent of the non-Huskins students were home-schooled. Wasley (2007) suggests that community college serves as the entry point into a four-year institution for an increasingly larger number of home-

schooled students. One reason home-schooled students might gravitate towards community college is because some four-year colleges and universities recommend that home-schooled students seeking admission into their institutions first attend a two-year college (Sorey & Duggan, 2008). Others may choose to commute to local two-year colleges rather than move out of town to attend four-year colleges because of enhanced attachment bonds with parents that developed over years of home-schooling. Still other home-schooled students may wish to move out of town, but enroll in community colleges because of parental encouragement to remain close to home.

Non-Cognitive College Readiness

Posttest scores on the College Survival and Success Scale (Liptak, 2006) were used to assess five different non-cognitive college readiness variables, including commitment to education, self- and resource-management skills, interpersonal and social skills, academic success skills, and career planning skills. The Huskins group, the non-Huskins dual enrollment group, the early college high school group, and the non-concurrently enrolled high school comparison group were included in this analysis. Significant differences between groups were detected through the use of ANOVAs and ANCOVAs. The effects of age, ethnicity, gender, and pretest levels of the five non-cognitive college readiness variables were controlled for in the ANCOVAs.

Commitment to Education

The performance of non-Huskins dually enrolled students. Posttest commitment to education was significantly higher for the non-Huskins dually enrolled students than for the non-concurrently enrolled high school students. However, when the effects of the eight pre-existing student characteristics were controlled for in an ANCOVA, the

significance of this effect disappeared. This indicates that the higher performance of the non-Huskins dually enrolled students is probably the result of pre-existing student characteristics rather than the effects of the non-Huskins dual enrollment program.

Although no inferential tests were conducted to determine whether significant differences between groups in *pretest* levels of the five non-cognitive variables were evident, pretest levels of these five variables were recorded as descriptive statistics and were utilized as control variables. The non-Huskins dually enrolled students had a higher mean pretest score on commitment to education than the non-concurrently enrolled high school students. Therefore, it is likely that the reason the non-Huskins dual enrollment group outperformed the non-concurrently enrolled high school comparison group in posttest commitment to education is because they had more commitment to education prior to the onset of concurrent enrollment. The non-Huskins dually enrolled students chose to commit extra time and effort into a concurrent enrollment program, while the non-concurrently enrolled students chose not to. This fact supports the notion that the non-Huskins dually enrolled students were more committed to education prior to the onset of the study.

The question that remains to be asked is "What is the source of the high level of commitment to education in non-Huskins dually enrolled students?" Once again, the answer may relate to the home-schooled background of most of these students. In lieu of the time and effort involved in home-schooling, parents who choose to home-school their children may have higher levels of commitment to education than the parents of children in public schools (Rudner, 1999). As a result, they may instill a higher level of commitment to education in their children. While there is research showing that home-

schooled college freshman have higher levels of institutional commitment (Saunders, 2010), research investigating other forms of commitment to education in home-schooled students is lacking.

The performance of early college high school students. Posttest commitment to education was significantly higher for the early college high school students than for the non-concurrently enrolled high school students in an ANOVA, with significance disappearing in an ANCOVA. These results indicate that pre-existing student characteristics are probably responsible for the higher posttest commitment to education of the early college high school students rather than the effects of the concurrent enrollment program.

As was the case with the non-Huskins dually enrolled students, the early college high school students had higher pretest levels of commitment to education than the non-concurrently enrolled high school students. This probably contributed to their higher posttest levels of commitment to education. CCTL is designed to serve accelerated learners who are not challenged by traditional high schools, students who are not achieving their academic potential in traditional high schools, students who are more likely to thrive in non-traditional high schools, and students who need more independence in order to excel (Brooks, 2009). Because of the challenges these types of students can have in traditional public high schools, they may be motivated to seek out alternative educational environments that enhance their learning potential. When these students are able to locate and participate in these alternative educational environments, the result might be enhanced commitment to education.

Self- and Resource-Management Skills

The performance of Huskins students. The Huskins group displayed a significantly higher level of self- and resource-management at posttest than the early college high school group. The significance of this effect disappeared after controlling for the effects of pre-existing student characteristics in an ANCOVA, indicating that pre-existing student characteristics are likely to be responsible for the higher posttest level of self- and resource-management in the Huskins students.

The Huskins students had higher levels of self- and resource-management than the early college high school students at pretest. This is probably the most obvious explanation for their higher levels of self- and resource-management at posttest. The Huskins students were also a little older (M = 16.8 years) than the early college high school students (M = 16.3 years). The youngest participants in the study were early college high school students. Perhaps some of these younger students didn't have the experience and maturity necessary to develop self- and resource-management skills comparable to those of the Huskins students.

As was previously mentioned, CCTL actively recruits first generation college-students (Brooks, 2009). This may have contributed to the significantly lower self- and resource-management skills of the early college high school students. Although status as a first generation college student was not assessed in this study, there is evidence that first generation college students may be less likely to have adequate knowledge of effective time-management techniques and the economic realities of college life (Hsiao, 1992). While parents who have successfully earned college degrees can often teach their children the self- and resource-management skills required for college success, the

parents of first-generation college students may be less likely to have the knowledge and experience necessary to help their children develop these skills (Collier & Morgan, 2008).

The performance of non-Huskins dually enrolled students. The non-Huskins dually enrolled students also displayed a significantly higher level of self- and resource-management skills at posttest than the early college high school students. As was the case with the Huskins group, the significance of this effect disappeared after controlling for pre-existing student characteristics in an ANCOVA.

All of the pre-existing student characteristics that may have contributed to the higher performance of the Huskins students compared to the early college high school students in posttest self- and resource-management skills may have contributed to the higher performance of the non-Huskins dually enrolled students. The non-Huskins dually enrolled students had higher pretest levels of self- and resource-management skills and were older than the early college high school students, and they were probably less likely to be first-generation college students than the early college high school students.

The performance of the combined group. When the Huskins and the non-Huskins dual enrollment groups were combined, this group had significantly higher posttest levels of self- and resource-management than the non-concurrently enrolled high school comparison group. Furthermore, this effect remained significant even after the effects of age, ethnicity, gender, and pretest levels of the five non-cognitive college readiness variables were controlled for in an ANCOVA. This result supports the possibility that concurrent enrollment programs at MCC had a positive effect on the self- and resource-management skills of the participants in this study.

Exposure to college classes may have forced the combined group of concurrently enrolled students to develop better self- and resource-management skills. In interviews with concurrently enrolled students, 44% indicated that their concurrent enrollment experiences taught them that students in college have more responsibilities than students in high school. Interviewees mentioned the need to attend class regularly, keep up with assignments, meet with college advisors, and pay one's own bills in order to be successful in college. Because the non-concurrently enrolled high school students had not yet taken any college classes, they may have not yet experienced the need to develop their self- and resource-management skills to the extent necessary for success in college. In addition, the opportunity to take college classes without having to pay tuition may have strengthened the motivation of the combined group of concurrently enrolled students to improve their self- and resource-management skills. They may have seen it as a rare opportunity that they did not want to waste.

The fact that the self- and resource-management skills of the concurrently enrolled students were only significantly higher than those of the non-concurrently enrolled high school students when the Huskins and non-Huskins dually enrolled groups were combined is intriguing. It is possible that both the Huskins programs and the non-Huskins dually enrolled program had positive effects on self- and resource management skills, but that group sample sizes were too small to provide the power necessary to detect significant differences that would support this conclusion unless the groups were combined.

Interpersonal and Social Skills and Academic Success Skills

No significant differences between groups were found in posttest interpersonal and social skills or posttest academic success skills. However, descriptive statistics revealed that the non-concurrently enrolled high school comparison group performed the lowest in both of these non-cognitive college readiness variables. This low performance was consistent with the results for the other three non-cognitive college readiness variables. The non-concurrently enrolled high school students also performed the lowest in posttest commitment to education and posttest career planning skills, and were the second lowest in posttest self- and resource-management skills (slightly ahead of the early college high school students).

Career Planning Skills

The performance of Huskins students. The Huskins group had a significantly higher posttest level of career planning skills as measured by the College Survival and Success Scale (Liptak, 2006) than the non-concurrently enrolled high school comparison group. Furthermore, the higher performance of the Huskins group remained significant after controlling for the effects of age, ethnicity, gender, and pretest levels of the five non-cognitive college readiness variables in an ANCOVA, supporting the possibility that participation in the Huskins program at MCC had a positive effect on career planning skills.

The Huskins program may promote career planning skills because taking college courses is likely to encourage high school students to choose career options and develop career plans. The college transfer courses into which Huskins students enroll are not dictated to them by others. Rather, these students are generally given the freedom to

choose between several Huskins courses. Making these choices, in the knowledge that credit will transfer into college-degree programs for grades of C or better, could cause students to think about what college degrees they wish to pursue. Furthermore, thought about college degrees is likely to stimulate thought about career options and career plans.

The performance of non-Huskins dually enrolled students. The non-Huskins dual enrollment group also had a significantly higher posttest level of career planning skills than the non-concurrently enrolled high school comparison group. As with the Huskins group, the higher performance of the non-Huskins dual enrollment group remained significant after controlling for the effects of pre-existing student characteristics in an ANCOVA, supporting the possibility that participation in this concurrent enrollment program at MCC had a positive effect on the career planning skills of the study's participants. As with the Huskins students, taking college courses may have encouraged the non-Huskins dually enrolled students to spend some time thinking about career options and developing career plans.

The performance of early college high school students. The early college high school group also had a significantly higher posttest level of career planning skills than the non-concurrently enrolled high school comparison group. Unlike the Huskins students and the non-Huskins dually enrolled students, however, the higher performance of the early college high school students lost significance in the ANCOVA. This result indicates that pre-existing student characteristics may have been contributed to their higher level of career planning skills.

The early college high school students had the highest pretest level of career planning skills. This may explain why they had higher career planning skills at posttest.

When students choose to attend CCTL, they often leave behind old high school friends and extracurricular activities that are only offered in traditional high schools. Perhaps a large percentage of the students who chose to make the sacrifices necessary to attend CCTL did so because of a commitment to embark on a career pathway.

Student Perceptions of Concurrent Enrollment

In an attempt discover how high school students perceive their concurrent enrollment experiences at MCC, nine concurrently enrolled students were asked four open-ended questions about the impact of their concurrent enrollment experiences (see Appendix F). Responses were analyzed to detect the presence of significant themes. Themes were considered significant if they were mentioned by at least four of the nine interviewees (44%). Using this criterion, the following seven themes emerged:

1. Academic success requires more effort in college than in high school,
2. Students must be more self-motivated in college than in high school,
3. Concurrent enrollment enhanced my college readiness,
4. Concurrent enrollment taught me what to expect from college,
5. Concurrent enrollment increased my desire for college,
6. Concurrent enrollment confirmed that I can succeed, and
7. Concurrent enrollment at MCC was a good experience.

Themes were coded as "moderately strong" if they were expressed by four, five, or six interviewees (44 to 67%). Themes were coded as "very strong" if they were expressed by seven or more interviewees (78 to 100%). Using this criterion, the third and seventh themes were classified as very strong, whereas the other five themes were classified as moderately strong.

Overall, the nine interviewed concurrently enrolled students at MCC seemed to be satisfied with their concurrent enrollment experiences. None of them said anything negative about their experiences in response to any of the four questions. It is possible that at least some of the positive statements regarding concurrent enrollment could have been the result of response bias. Response bias can be defined as the tendency for respondents to distort their answers in a direction favorable to the person asking the questions (Fuller, 1974). The author of this dissertation is also an instructor at MCC, and some of the students interviewed were taking or had taken courses taught by the instructor. Therefore, it is reasonable to assume that the interviewees wished to appear supportive and cooperative, and thus may have exaggerated the benefits of their exposure to concurrent enrollment.

The fact that interviewees provided details regarding ways in which concurrent enrollment increased their knowledge about college, increased their college readiness, and increased their desire for college, however, supports the notion that their positive statements about their concurrent enrollment experiences were sincere. Interviewees indicated that concurrent enrollment increased their knowledge about college by showing them that success in college requires more effort than success in high school, and that students must be more self-motivated in college than in high school. This is an important finding, because college success often requires that students adjust to new academic expectations and enhanced personal freedom during the freshman year (Gardner, 1986; Gardner, Jewler, & Barefoot, 2008). Interviewees also indicated that concurrent enrollment increased their college readiness by teaching them what to expect. Enrollment in college classes helped high school students know what college professors, college

textbooks, and college work would be like. In addition, interviewees indicated that concurrent enrollment increased their desire for college and showed them that they can succeed. Evidence that concurrent enrollment enhanced desire for college and confidence in college success is provided by the following quotes:

- "Moving away from home and going somewhere is kind of scary to me. But I know being able to see what college is like here, near home, has helped me to see that it's not as bad as I thought." (Huskins student)
- "College is not so intimidating now." (non-Huskins dually enrolled student)
- "College is very flexible. I get to make up my schedule. I get to choose when I take classes and what day of the week. I love doing that." (early college high school student)

Limitations of Study

This study had five major limitations. The first was that it did not address college performance in concurrently enrolled participants after they graduated from high school and were accepted into degree-granting programs. Arguably, this would have been the best measure of college readiness. After all, there is no way of truly knowing whether or not students are college ready until they actually enter an associate or baccalaureate program and either do well or do poorly.

Nevertheless, the measures of cognitive and non-cognitive college readiness utilized in this study seemed intuitively valid. High percentages of transferable grades of C or better in college courses taken as a concurrent enrollment student, high scores on the five non-cognitive variables assessed by the College Survival and Success Scale (Liptak, 2006), and a high acceptance rate into regular four-year postsecondary institutions to

which applications have been sent obviously seem to indicate that a student is prepared for college. It therefore seemed appropriate to use these variables as indicators of college readiness.

The second limitation was that the study did not exclude the possibility that prior differences in academic ability between concurrently enrolled and non-concurrently enrolled high school students might result in a spurious correlation between concurrent enrollment and college readiness. The reason for this limitation was the non-concurrently enrolled high school students did not take the MCC ACCUPLACER tests. Therefore, there were no data on the reading, sentence skills, arithmetic, or algebra ability of this comparison group. The obtainment of high school grade point averages would have remedied this problem, but unfortunately, except for the older college student comparison group, that information was unavailable as well. The main reason that high school grade point averages were not collected is because the need for this information was not recognized until the informed consent forms had already been collected and the data collection process had already begun.

However, even though ACCUPLACER scores and grade point averages were unavailable for the non-concurrently enrolled high school comparison group, there was other evidence suggesting that the students in the non-concurrently enrolled comparison group had a level of academic achievement similar to that of the concurrently enrolled students. First, only students in the college preparatory track at their high schools were utilized in the non-concurrently enrolled high school comparison group. This ensured that all of the high school students sampled, whether concurrently enrolled or not, had aspirations towards academic college degrees. Second, the minimum 2.50 grade point

average required for inclusion in the non-concurrently enrolled high school sample was the same minimum grade point average required for admission into the Huskins program.

The third limitation of this study was that it did not control for all possible pre-existing differences between groups. While statistical analyses controlled for the effects of age, ethnicity, gender, reading ability, sentence skills ability, arithmetic ability, algebra ability, prior completion of college transfer courses, completion of college developmental courses, and pretest levels of the five non-cognitive college readiness variables assessed by the College Survival and Success Scale (Liptak, 2006), there may have been additional pre-existing student characteristics that had effects on cognitive and non-cognitive college readiness. Examples of unexamined variables that may have affected college readiness include high school GPA, high school courses previously taken by students, socioeconomic status, and student personality traits.

The fourth limitation of this study was that data were only collected from one community college. Concurrent enrollment programs vary significantly from state to state (American Association of State Colleges and Universities, 2002; Karp, Bailey, et al., 2004). Therefore, the results of this research cannot be generalized to concurrent enrollment programs in other states. In fact, it is not even be possible to generalize the results to other community colleges in North Carolina. MCC concurrent enrollment programs differ from other programs in several important ways. At the state level, for example, the North Carolina standards require that Huskins students be in grades nine through twelve, and stipulate that they may have their textbooks and fees paid for by local boards of education. At MCC, however, Huskins students must pay for their textbooks and must be either juniors or seniors (Mitchell Community College, 2007).

The fifth limitation of this study was that sample sizes were small. The largest group (the regularly matriculated college comparison group) only had 50 participants, while the smallest group (the non-Huskins dual enrollment group) only had 10 participants. These small sample sizes may have weakened the power of statistical tests to the extent that real differences between groups did not reach statistical significance.

Implications

This study shows that the relationship between concurrent enrollment and positive academic outcomes may be dependent on the type of concurrent enrollment program. Whereas the Huskins and non-Huskins dually enrolled students at Mitchell Community College only displayed comparable or significantly higher levels of cognitive and non-cognitive college readiness in between-group comparisons, the early college high school students displayed significantly *lower* levels of college readiness in two areas: grades of C or better and self- and resource-management skills. The only two areas in which the early college high school students had significantly higher levels of college readiness were commitment to education and career planning skills. This result has implications for high school teachers, college instructors, and any administrators involved in the operation of early college high schools. Early college high school teachers and administrators may need to collaborate more with college faculty to ensure that the skills needed to make good grades in college courses are being emphasized. They may also need to place more emphasis on conveying the importance of self- and resource-management skills, such as time management and getting enough sleep, to early college high school students.

All three concurrent enrollment groups displayed higher levels of college readiness than either of the two comparison groups. The regularly matriculated college

students and the non-concurrently enrolled college-bound high school students did not out-perform any of the concurrent enrollment groups on any of the college readiness variables. This result is consistent with a great deal of literature indicating that concurrent enrollment is associated with a variety of positive academic outcomes (see chapter 2). This result implies that students, parents, teachers, and administrators can have confidence that most of the high school students who qualify for concurrent programs are capable of college success. Therefore, the participation of qualified students in these programs should be encouraged.

An additional insight gained from this study is that concurrent enrollment programs are associated with enhanced non-cognitive college readiness. Significant differences between concurrent enrollment groups and comparison groups were found in posttest levels of commitment to education, posttest self- and resource-management skills, and posttest career planning skills. This is an important result considering the paucity of research on non-cognitive college readiness in concurrently enrolled students. The implication of this result is that students, parents, teachers, and administrators should view concurrent enrollment programs not only as ways for high school students to gain college credit, but also as opportunities that may have the potential to help students develop important non-cognitive college success skills.

This study also shows that the association between concurrent enrollment and college readiness sometimes remains significant even after controlling for the effects of a wide variety of pre-existing student characteristics. Even after controlling for the effects of age, ethnicity, gender, completion of college transfer courses, completion of developmental education courses, reading ability, sentence skills ability, arithmetic

ability, algebra ability, and pretest levels of the five non-cognitive college readiness variables assessed by the College Survival and Success Scale (Liptak, 2006), some concurrent enrollment groups continued to display higher performance in some college readiness variables. Although this result does not prove that concurrent enrollment enhances college readiness, it does imply that the relationship between these two variables may be due to factors other than pre-existing student characteristics. Therefore, educators, researchers, and policy-makers should investigate the possibility that concurrent enrollment may have a positive impact on college readiness.

Recommendations for Future Research

As a result of this study, there are eleven recommendations. In order to enhance clarity and readability, these recommendations are presented in a numbered list. The recommendations are as follows:

1. In future investigations of the relationship between concurrent enrollment and college readiness, there is a need to compare the performance of different types of concurrently enrolled students after they have matriculated into postsecondary institutions. Even though the measures of cognitive college readiness utilized in this study were useful, the best measures of this variable may be grades and retention rates after college admission.
2. In future investigations, there is a need to control for the effects of high school GPA. The results of this study provided reasons to suspect that high school GPA may have an impact on between-group differences in college readiness (e.g., the significantly higher probability of grades of C or better for the Huskins students

than for the regularly matriculated college students and early college high school students).

3. In future investigations, there is a need to control for the effects of other variables that were unexamined in this study, such as previous high school courses, socioeconomic status, and student personality traits.
4. There is a need to replicate this study in other settings. If similar results are found in other locations, then conclusions about the relationship between concurrent enrollment and college readiness will gain external validity.
5. There is a need to replicate this study with larger group sample sizes. The enhanced statistical power associated with larger sample sizes might reveal statistically significant differences in college readiness that were not evident in this study.
6. There is a need for research on the impact of home-schooling on concurrent enrollment and college readiness. Eighty percent of the non-Huskins dually enrolled students were home-schooled. This may have contributed to their higher probability of making Cs or better in college transfer courses than their regularly matriculated college classmates, and to their higher posttest level of commitment to education than the non-concurrently enrolled high school students.
7. Although this is tangential to the topic of concurrent enrollment, this study revealed a need for additional research on the connection between home-schooling and community college enrollment. In this study, the non-Huskins dually enrolled students were significantly more likely to apply to two-year colleges than the other groups, and 66.7% of them chose to attend two-year

colleges. Eighty percent of the non-Huskins dually enrolled students were home-schooled, supporting Wasley's (2007) notion that home-schooled students are likely to matriculate into community colleges.

8. There is a need for additional research on the impact of *pre-existing* levels of non-cognitive college readiness on concurrent enrollment and college readiness. The results of this study revealed that between-group differences in pre-existing levels of commitment to education, self- and resource-management skills, and career planning skills may be responsible for some of the between-group differences at posttest, as opposed to the effects of the concurrent enrollment programs.
9. There is a need for research utilizing regression analyses to determine the extent to which participation in concurrent enrollment and pre-existing student characteristics account for variance in cognitive and non-cognitive college readiness variables. Although controlling for the effects of pre-existing student characteristics in ANCOVAs provided some ability to judge whether between-group differences were likely due to exposure to concurrent enrollment or due to pre-existing student characteristics, the statistical analyses utilized in this study did not reveal the extent to which participation in concurrent enrollment and each of the 14 control variables affected the outcome measures of college readiness.
10. There is a need for more research identifying the needs of early college high school students. In this study, the early college high school students displayed significantly lower probabilities of Cs or better in college transfer courses and significantly lower self- and resource-management skills than some of the other concurrent enrollment groups. If this result is found in other studies, early college

high school administrators and teachers may need to develop strategies to help their students improve in these areas.

11. There is a need for more research investigating how affective concurrent enrollment programs are at recruiting academically at-risk students. One of the primary goals of the early college high school program in North Carolina is "to attract students who are often under-represented in post-secondary education: (such as) minorities, students from low-income families, and first-generation college students" (North Carolina New Schools Project, 2008, ¶ 2). Although there is less emphasis on the recruitment of at-risk students in the Huskins and non-Huskins dual enrollment programs, these programs represent attempts to "improve the equalization of opportunities" (Mitchell Community College, 2007, p. 1). The few studies that have been done on the recruitment of at-risk students into concurrent enrollment programs indicate that while some programs affectively recruit at-risk students (Meld, 2000, as cited in Zarkesh, 2004; Welsh et al, 2005), most tend to recruit highly motivated, academically skilled students (Bailey et al., 2002; Golann & Hughes, 2008).

Concluding Remarks

Although the results of this study of concurrent enrollment at Mitchell Community College should not be generalized to other settings, the study is important for several reasons. First, it revealed that there may be differences in college readiness between participants in different types of concurrent enrollment programs. Whereas most prior research simply showed that concurrent enrollment was associated with enhanced college readiness, this study was among the few to investigate outcome differences

between programs. Second, this study revealed that concurrently enrolled students may have higher levels of non-cognitive college readiness than comparison groups. Prior research on concurrent enrollment usually focused exclusively on cognitive college readiness. Third, this study revealed that the association between concurrent enrollment and enhanced cognitive and non-cognitive college readiness sometimes remains significant after controlling for a wide variety of pre-existing student characteristics. Most of the prior research on the effects of concurrent enrollment did not control for the effects of pre-existing students characteristics, and the few studies that did used fewer control variables than this study. It is the sincere hope of the author that this approach will prove useful for others who are interested in pursuing similar studies at other settings or investigating the recommended areas for future research.

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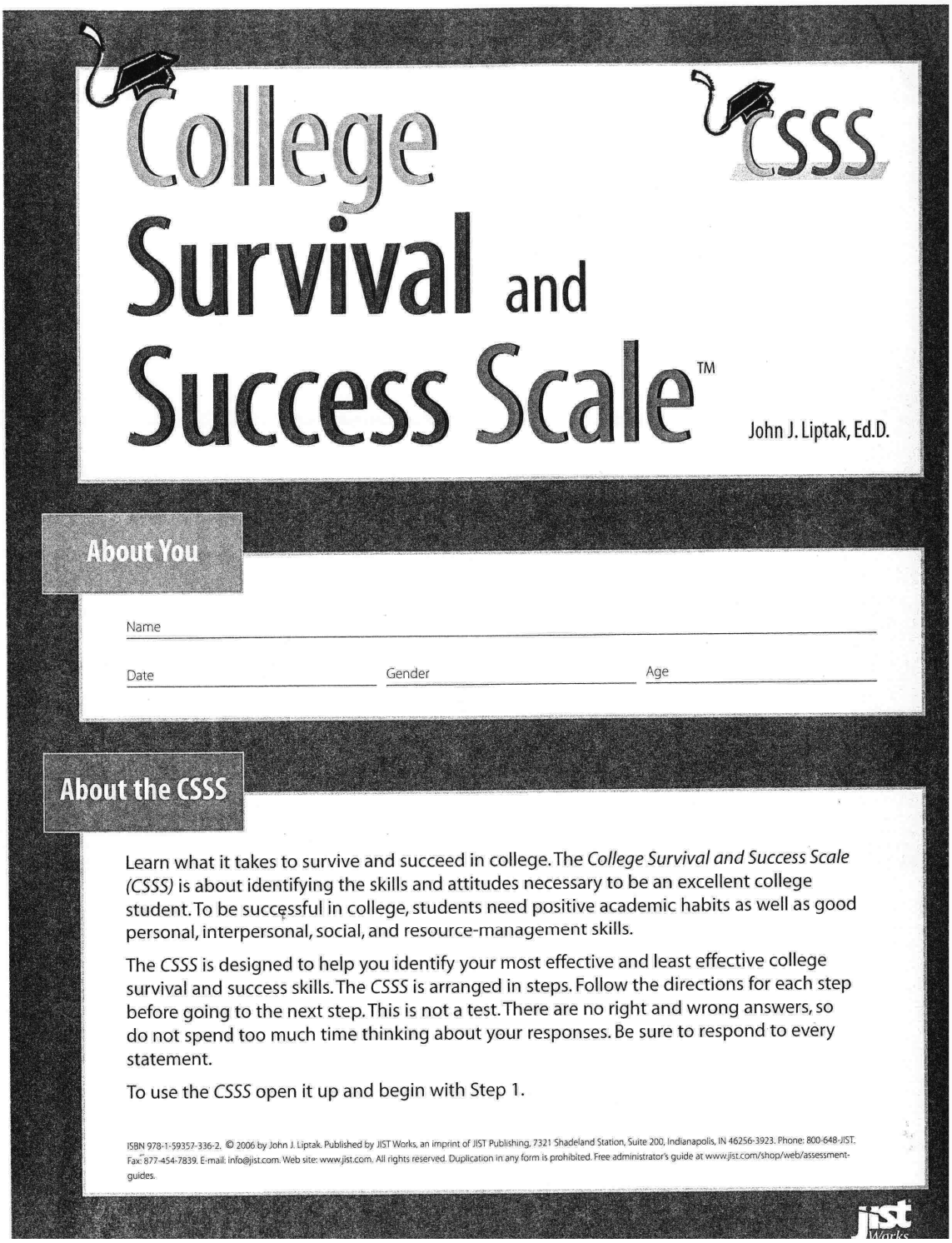
APPENDIX A

The College Survival and Success Scale


College
CSSS
Survival and
Success Scale™
John J. Liptak, Ed.D.
About You
Name
Date
Gender
Age
About the CSSS
Learn what it takes to survive and succeed in college. The College Survival and Success Scale (CSSS) is about identifying the skills and attitudes necessary to be an excellent college student. To be successful in college, students need positive academic habits as well as good personal, interpersonal, social, and resource-management skills.
The CSSS is designed to help you identify your most effective and least effective college survival and success skills. The CSSS is arranged in steps. Follow the directions for each step before going to the next step. This is not a test. There are no right and wrong answers, so do not spend too much time thinking about your responses. Be sure to respond to every statement.
To use the CSSS open it up and begin with Step 1.
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STEP 1

Complete the *CSSS*

The *CSSS* is divided into five color-coded sections, each with twelve statements. Read each statement and decide how much it describes you. Then circle the corresponding number next to the statement. In the following example, the circled number indicates that the statement was somewhat like the person completing the assessment:

Example

In college, I (would)...	A Lot Like Me	Somewhat Like Me	A Little Like Me	Not Like
1. Have an interest in learning all I can	4	(3)	2	1

Now respond to the statements before moving to Step 2.

STEP 2

Add Your Scores

The *CSSS* is designed to measure your ability to survive and thrive in college. The items in the scales are grouped so that you may explore how your attitudes are related to potential college success.

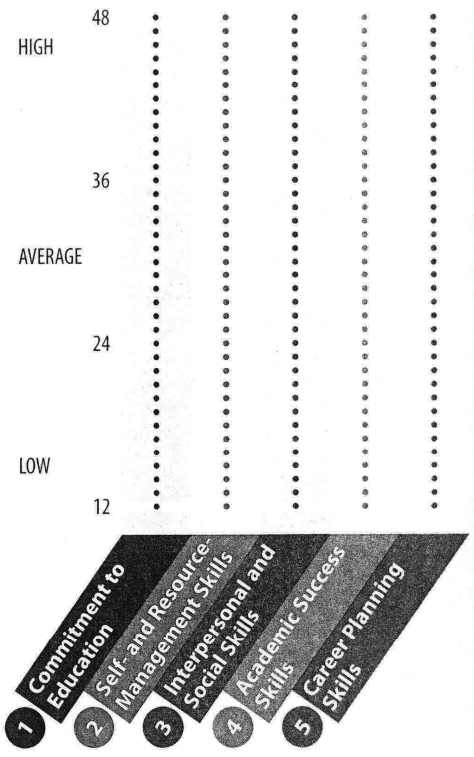
Add up the scores you circled for each of the color-coded sections in Step 1. Put each total on the line in the Total column at the right of the section.

For each section, you will have a total between 12 and 48.

STEP 3

Profile Your Scores

Chart your scores by placing an **X** along each line.



Scores from 12–23 are LOW and indicate that you need to be more proactive and do more to both survive and succeed in college.

Scores from 24–36 are AVERAGE and indicate that you are probably doing enough to survive, but need to be more proactive and do more to succeed in college.

Scores from 37–48 are HIGH and indicate that you are probably being proactive and doing the things that are necessary to both survive and succeed in college.

In college, I (would)...	A Lot Like Me	Somewhat Like Me	A Little Like Me	Not Like Me
1. Have an interest in learning all I can	4	3	2	1
2. Embrace learning for the sake of learning	4	3	2	1
3. Believe that learning will greatly improve my life and my career	4	3	2	1
4. Believe that I can learn outside of school as well as in school	4	3	2	1
5. Believe that education is more than the process of going to school	4	3	2	1
6. Believe that education will help me feel better about myself	4	3	2	1
7. Have a plan for spending my time	4	3	2	1
8. Learn all I can about financial aid	4	3	2	1
9. Find out about the student loans and grants available to me	4	3	2	1
10. Efficiently budget my money	4	3	2	1
11. Have a money management plan	4	3	2	1
12. Control my alcohol and drug use	4	3	2	1
13. Lead other people in projects	4	3	2	1
14. Give and receive constructive criticism	4	3	2	1
15. Speak comfortably in front of other people	4	3	2	1
16. Listen actively to others when they speak	4	3	2	1
17. Relate well to others	4	3	2	1
18. Feel comfortable with diversity in others	4	3	2	1
19. Listen attentively in class	4	3	2	1
20. Underline or highlight important points while I read	4	3	2	1
21. Constantly revise my writing for clarity and accuracy	4	3	2	1
22. Avoid distractions when I study	4	3	2	1
23. Remember important information easily	4	3	2	1
24. Remain calm and confident during exams	4	3	2	1
25. Create a career portfolio of my accomplishments	4	3	2	1
26. Engage in campus or community activities that will build skills	4	3	2	1
27. Gather information about my career interests	4	3	2	1
28. Explore potential occupations	4	3	2	1
29. Develop a comprehensive career plan	4	3	2	1
30. Have a clear understanding of my skills and abilities	4	3	2	1

In college, I (would)...	A Lot Like Me	Somewhat Like Me	A Little Like Me	Not Like Me	
31. Believe that education gives me the tools to learn how to think	4	3	2	1	Section 1
32. Believe that education helps me appreciate politics and art	4	3	2	1	TOTAL
33. Want to constantly learn new things	4	3	2	1	
34. Learn all I can about new technological advances	4	3	2	1	
35. Believe that education will increase my income	4	3	2	1	
36. Learn about things that are not familiar to me	4	3	2	1	
37. Exercise regularly and eat a well-balanced diet	4	3	2	1	Section 2
38. Use technology to save time and money	4	3	2	1	TOTAL
39. Refuse to engage in activities that do not benefit me	4	3	2	1	
40. Balance school with work and my social life	4	3	2	1	
41. Get enough sleep so I can learn effectively	4	3	2	1	
42. Manage my credit card spending effectively	4	3	2	1	
43. Effectively express myself to others	4	3	2	1	Section 3
44. Handle conflict effectively	4	3	2	1	TOTAL
45. Maintain a strong network of relationships	4	3	2	1	
46. Assert myself when I need to	4	3	2	1	
47. Make friends easily	4	3	2	1	
48. Join organizations and clubs	4	3	2	1	
49. Start reviewing for tests long before the exam dates	4	3	2	1	Section 4
50. Take effective notes in class	4	3	2	1	TOTAL
51. Remain self-disciplined in achieving my educational goals	4	3	2	1	
52. Set high academic standards for myself	4	3	2	1	
53. Rarely procrastinate in completing assignments	4	3	2	1	
54. Effectively plan for large writing assignments	4	3	2	1	
55. Read about occupations of interest to me	4	3	2	1	Section 5
56. Talk with a career counselor about my career options	4	3	2	1	TOTAL
57. Know which majors best match my personality and interests	4	3	2	1	
58. Gather information about the world of work on the Internet	4	3	2	1	
59. Develop a list of long-term and short-term career goals	4	3	2	1	
60. Find and use a specific career decision-making process	4	3	2	1	

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(317) 613-4237
spines@jist.com
April 1, 2009

Todd Martin
712 Waverly Place
Statesville, NC 28677

Dear Mr. Martin:

Thank you for requesting permission to duplicate John Liptak's *College Survival and Success Scale* as an appendix to your dissertation.

We grant you permission to duplicate the assessment as explained in your letter, along with a reference to John Liptak as the author and JIST Publishing as the publisher.

If at all possible, we would like to receive a copy of your dissertation for our files when it is completed.

Best wishes with your project. Thanks again for contacting us.

Sincerely,

Susan Pines

Susan Pines

APPENDIX B

Student Consent Form

APPALACHIAN STATE UNIVERSITY

Informed Consent for Participants in
Research Projects Involving Human Subjects

(For Students)

(Your parents/guardians must provide consent on a different form in order for you to participate in this project.)

Title of Project: Implementing a Model for Assessment of Student Performance in Cognitive and Non-Cognitive College Readiness Variables in Concurrent Enrollment Programs at a North Carolina Community College

Investigator: Todd C. Martin

I. Purpose of this Project

The purpose of this project is to discover whether any of the types of concurrent enrollment at Mitchell Community College (MCC) help make high school students more prepared for college. Concurrent enrollment is defined as participation in college courses and the earning of college credits by high school students. The three types of concurrent enrollment that will be examined are the Huskins dual credit program, non-Huskins dual enrollment *(usually referred to simply as "dual enrollment")*, and the on-campus early college high school *(the Collaborative College of Technology and Leadership, or CCTL).*

Five groups of students will be involved in this project. These are the three types of concurrently enrolled high school students, high school students who are taking the college/university prep course of study at their high schools and have G.P.A.s of at least 2.50 but are not participating in concurrent enrollment, and older MCC college students who are taking college classes with concurrently enrolled high school students. Between five hundred and eight hundred students are expected to participate.

II. Procedures

This project will begin in August, 2008, and will take about a year to complete. The procedures for the three types of concurrently enrolled high school students participating will involve five things. First, their ACCUPLACER placement test scores at MCC will be obtained. Second, they will complete a survey on college readiness called "The College Survival and Success Scale" either two or three times: near the beginning of the fall semester, possibly near the end of the fall semester, and near the end of the spring semester *(if they take college classes in the spring).* Third, their fall and spring MCC grades will be obtained. Fourth, if they are seniors, information on whether or not they are later admitted into two- or four-year colleges will be obtained. Fifth, some of these concurrently enrolled students will participate in focus groups in which they are allowed to answer open-ended questions about their views on concurrent enrollment. All focus group sessions will take place at MCC, and will be videotaped.

College/university prep high school students who are not participating in concurrent enrollment will also complete The College Survival and Success Scale either two or three times *(They will definitely take the survey near the beginning of the school year and near the end. Taking the survey in the middle of the school year, in November or December, may or may not be necessary).* If they are seniors, information on whether or not they are later admitted into two- or four-year colleges will be obtained. However, because these students will not be taking college courses, their ACCUPLACER scores and college grades will not be obtained, and they will not be participating in focus groups.

The only procedures that will apply to the older MCC college students taking classes with concurrently enrolled high school students are the assessment of their ACCUPLACER scores and their grades in the courses they are taking with the concurrently enrolled students. These students will not take The College Survival and Success Scale or participate in focus groups.

III. Risks

Because I will be collecting college placement test scores, college grades, information on college readiness, and information on acceptance into two- or four-year colleges, you may experience a certain amount of embarrassment or shame as a result of participation in this project. Furthermore, being in the presence of peers and being videotaped during focus group sessions may cause embarrassment or self-

consciousness. There is also a risk that other participants in the focus groups may tell others things you'd rather they kept to themselves regarding your responses to focus group questions.

However, I will try to minimize these risks by taking steps to prevent anybody other than your teacher and me from obtaining materials related to this project with your name on them. Furthermore, I will not reveal your identity during conversation, I will discourage other focus group members from revealing your identity or discussing any information brought up in focus group sessions with others, and I will discourage teachers who receive your consent forms from revealing your identity to others. I will also provide envelopes with your college readiness surveys, so if you are concerned that your teachers might read your responses, you can either return your surveys to your teachers in sealed envelopes for me to collect later, or mail them directly to me. Further details are provided below in Section V: Extent of Anonymity and Confidentiality.

IV. Benefits

There will be no direct benefits to you as a result of participation in this project. However, because this project has the potential to contribute to knowledge on whether or not concurrent enrollment actually works, it may be beneficial to educators and policy-makers. A lot of time, energy, and money are being invested into the development and operation of these three concurrent enrollment options. This project may contribute to the ability to judge whether or not this time, energy, and money are being well spent. Furthermore, this project may contribute to the ability of parents and their college-bound children to make informed decisions about which, if any, concurrent enrollment options to consider.

V. Extent of Anonymity and Confidentiality

Anonymity means "nobody knows that you said it or did it." Confidentiality means "although somebody knows that you said it or did it, that person won't tell anybody else." The nature of this project will prevent the possibility of anonymity. However, although I cannot guarantee total confidentiality, I will take steps to provide you with as much confidentiality as possible.

Because your teacher is being allowed to receive forms indicating agreement to participate in the project, there may be limits to confidentiality in this particular area. However, you will have the option of mailing your consent form *(and your parent's consent form if you are in high school and/or under eighteen)* directly to me. Furthermore, I will remind teachers of their obligation to not reveal to anybody other than me who will or won't be participating in this project.

In order to identify which of the five groups your college readiness surveys apply to, I will need you to record your name on The College Survival and Success Scale. However, in order to provide you with as much confidentiality as possible, I will provide envelopes with your surveys. This will enable those of you who are concerned that your teachers might read your responses to either return them to your teachers in sealed envelopes for me to collect later, or mail them directly to me. Furthermore, I will store all completed surveys in my office behind a locked door, and destroy them after this project has been completed.

In order to assess placement test scores, college grades, and admission into two- or four-year colleges, I will need to know your name. Therefore, I cannot provide anonymity in these areas. However, I will try to provide confidentiality by not revealing your name during or after this project to anybody else, by storing all lists of names in my office behind a locked door, and by destroying all lists of names immediately after this project has been completed.

In order to properly analyze focus group responses, it will be necessary for me to videotape them. This will make anonymity impossible. However, I will try to provide confidentiality by not showing these videotapes to anybody else, by storing them in my office behind a locked door, and by destroying them immediately after this project has been completed. I will also remind all focus group participants of their obligation to protect the confidentiality of each other by not revealing the identities of group members and by not discussing any information brought up in focus group sessions with others.

VI. Compensation

No money will be provided as a reward for your participation in this project. However, I will provide you with small tokens of my appreciation at the conclusion of the project in May. These tokens will be

in the form of coupons and discounts from several local establishments (e.g., Hollywood Video, McDonalds, Wendys, etc.).

VII. Freedom to Withdraw

Not only is participation completely voluntary; you are also free to withdraw from the project at any time without penalty. You will not suffer any reduction in points or grades in any course or be denied any opportunities as a consequence of choosing not to participate or choosing to withdraw. Furthermore, you will be free to refuse to answer any particular questions asked during the course of this project.

VIII. Approval of Research

This research project has been approved, as required, by the Institutional Review Board of Appalachian State University, Mitchell Community College, Iredell/Statesville Schools, and Mooresville Graded School District.

_____ _____

IRB Approval Date Approval Expiration Date

IX. Subject's Responsibilities

If you voluntarily agree to participate in this study, you have the following responsibilities:

- You need to read and sign this form.
- You need to either give this signed form to your parent/guardian to be mailed to me *(along with his or her signed consent form)*, mail it to me yourself, or give all necessary forms to your teacher or to me (Todd Martin) by the deadline *(to be determined later).*
- You need to complete the college readiness survey either two or three times *(to be determined later),* and return your completed survey to your teacher in a timely manner each time.
- If you agree to join a focus group, you need to read and think about any questions provided in advance of the actual focus group session, and show up on time.

X. Subject Permission

I have read and understand the Informed Consent and conditions of this project. I have had all my questions answered. I hereby acknowledge the above and give my voluntary consent.

_____ _____

Subject signature Date

_____

Please ***print*** your name here.

Should I have any questions about this research or its conduct, I may contact:

Todd C. Martin	(704) 883-8344	reneestacy@hotmail.com
Investigator	Telephone	e-mail
712 Waverly Place		
Statesville, NC 28677		

Dr. Barbara Bonham	(828) 262-6036	bonhambs@appstate.edu
Faculty Advisor	Telephone	e-mail

Dr. Jay Cranston (828) 262-2692 irb@appstate.edu
Chair, IRB
Graduate Studies and Research
Appalachian State University, Boone, NC 28608

APPENDIX C

Parental Consent Form

APPALACHIAN STATE UNIVERSITY

Informed Consent for Participants in
Research Projects Involving Human Subjects

(For Parents / Guardians)

Title of Project: Implementing a Model for Assessment of Student Performance in Cognitive and Non-Cognitive College Readiness Variables in Concurrent Enrollment Programs at a North Carolina Community College

Investigator: Todd C. Martin

I. Purpose of this Project

The purpose of this project is to discover whether any of the types of concurrent enrollment at Mitchell Community College (MCC) help make high school students more prepared for college. Concurrent enrollment is defined as participation in college courses and the earning of college credits by high school students. The three types of concurrent enrollment that will be examined are the Huskins dual credit program, non-Huskins dual enrollment *(usually referred to simply as "dual enrollment")*, and the on-campus early college high school *(the Collaborative College of Technology and Leadership, or CCTL).*

Five groups of students will be involved in this project. These are the three types of concurrently enrolled high school students, high school students who taking the college/university prep course of study at their high schools and have G.P.A.s of at least 2.50 but are not participating in concurrent enrollment, and older MCC college students who are taking college classes with concurrently enrolled high school students. Between five hundred and eight hundred students are expected to participate.

II. Procedures

This project will begin in August, 2008, and will take about a year to complete. The procedures for the three types of concurrently enrolled high school students participating will involve five things. First, their ACCUPLACER placement test scores at MCC will be obtained. Second, they will complete a survey on college readiness called "The College Survival and Success Scale" either two or three times: near the beginning of the fall semester, possibly near the end of the fall semester, and near the end of the spring semester *(if they take college classes in the spring).* Third, their fall and spring MCC grades will be obtained. Fourth, if they are seniors, information on whether or not they are later admitted into two- or four-year colleges will be obtained. Fifth, some of these concurrently enrolled students will participate in focus groups in which they are allowed to answer open-ended questions about their views on concurrent enrollment. All focus group sessions will take place at MCC, and will be videotaped.

College/university prep high school students who are not participating in concurrent enrollment will also complete The College Survival and Success Scale either two or three times *(They will definitely take the survey near the beginning of the school year and near the end. Taking the survey in the middle of the school year, in November or December, may or may not be necessary).* If they are seniors, information on whether or not they are later admitted into two or four-year colleges will be obtained. However, because these students will not be taking college courses, their ACCUPLACER scores and college grades will not be obtained, and they will not be participating in focus groups.

The only procedures that will apply to the older MCC college students taking classes with concurrently enrolled high school students are the assessment of their ACCUPLACER scores and their grades in the courses they are taking with the concurrently enrolled students. These students will not take The College Survival and Success Scale or participate in focus groups.

III. Risks

Because I will be collecting college placement test scores, college grades, information on college readiness, and information on acceptance into two or four-year colleges, your adolescent child may experience a certain amount of embarrassment or shame as a result of participation in this project. Furthermore, being in the presence of peers and being videotaped during focus group sessions may cause embarrassment or self-consciousness. There is also a risk that other participants in the focus groups may tell others things that your child would rather they kept to themselves regarding his or her responses to focus group questions.

However, I will try to minimize these risks by taking steps to prevent anybody other than your child's teacher and me from obtaining materials related to this project with your child's name on them. Furthermore, I will not reveal your child's identity during conversation, I will discourage other focus group members from revealing your child's identity or discussing any information brought up in focus group sessions with others, and I will discourage teachers who receive your child's consent forms from revealing your child's identity to others. I will also provide envelopes with college readiness surveys, so students who are concerned that their teachers might read their responses can either return their surveys to their teachers in sealed envelopes for me to collect later, or mail them directly to me. Further details are provided below in Section V: Extent of Anonymity and Confidentiality.

IV. Benefits

There will be no direct benefits to your adolescent child as a result of participation in this project. However, because this project has the potential to contribute to knowledge on whether or not concurrent enrollment actually works, it may be beneficial to educators and policy-makers. A lot of time, energy, and money are being invested into the development and operation of these three concurrent enrollment options. This project may contribute to the ability to judge whether or not this time, energy, and money are being well spent. Furthermore, this project may contribute to the ability of parents and their college-bound children to make informed decisions about which, if any, concurrent enrollment options to consider.

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Anonymity means "nobody knows that you said it or did it." Confidentiality means "although somebody knows that you said it or did it, that person won't tell anybody else." The nature of this project will prevent the possibility of anonymity. However, although I cannot guarantee total confidentiality, I will take steps to provide your adolescent child with as much confidentiality as possible.

Because your child's teacher is being allowed to receive forms indicating agreement to participate in the project, there may be limits to total confidentiality in this particular area. However, as a parent or guardian, you will have the option of mailing your consent form and your child's form indicating agreement to participate directly to me. Furthermore, I will remind teachers of their obligation to not reveal to anybody other than me who will or won't be participating in this project.

In order to identify which of the five groups your child's college readiness surveys apply to, I will need your child to record his or her name on The College Survival and Success Scale. However, in order to provide your child with as much confidentiality as possible, I will provide envelopes with the surveys. This will enable students who are concerned that their teachers might read their responses to either return them to their teachers in sealed envelopes for me to collect later, or mail them directly to me. Furthermore, I will store all completed surveys in my office behind a locked door, and destroy them after this project has been completed.

In order to assess placement test scores, college grades, and admission into two or four-year colleges, I will need to know your child's name. Therefore, I cannot provide anonymity in these areas. However, I will try to provide confidentiality by not revealing your child's name during or after this project to anybody else, by storing all lists of names in my office behind a locked door, and by destroying all lists of names immediately after this project has been completed.

In order to properly analyze focus group responses, it will be necessary for me to videotape them. This will make anonymity impossible. However, I will try to provide confidentiality by not showing these videotapes to anybody else, by storing them in my office behind a locked door, and by destroying them immediately after this project has been completed. I will also remind all focus group participants of their obligation to protect the confidentiality of each other by not revealing the identities of group members and by not discussing any information brought up in focus group sessions with others.

VI. Compensation

No money will be provided as a reward for your child's participation in this project. However, I will provide him or her with small tokens of my appreciation at the conclusion of the project in May. These tokens will be in the form of coupons and discounts from several local establishments (e.g., Hollywood Video, McDonalds, Wendys, etc.).

VII. Freedom to Withdraw

Not only is participation completely voluntary; your child is also free to withdraw from the project at any time without penalty. He or she will not suffer any reduction in points or grades in any course or be denied any opportunities as a consequence of choosing not to participate or choosing to withdraw. Furthermore, your child will be free to refuse to answer any particular questions asked during the course of this project.

VIII. Approval of Research

This research project has been approved, as required, by the Institutional Review Board of Appalachian State University, Mitchell Community College, Iredell/Statesville Schools, and Mooresville Graded School District.

_____ _____
IRB Approval Date Approval Expiration Date

IX. Parent/Guardian Responsibilities

If you voluntarily agree to allow your child to participate in this study, you will have the following responsibilities:

- You will need to return this informed consent form with your signature, either by mail or by giving it to your child to be delivered to his or her teacher or to me (Todd Martin), by the deadline which will be determined later.

X. Parent/Guardian Permission

I have read and understand the Informed Consent and conditions of this project. I have had all my questions answered. I hereby acknowledge the above and give my voluntary consent.

_____ _____
Parent/Guardian signature Date

_____
Please ***print*** your child's name here.

Should I have any questions about this research or its conduct, I may contact:

Todd C. Martin	(704) 883-8344	reneestacy@hotmail.com
Investigator 712 Waverly Place Statesville, NC 28677	Telephone	e-mail
Dr. Barbara Bonham	(828) 262-6036	bonhambs@appstate.edu
Faculty Advisor	Telephone	e-mail
Dr. Jay Cranston Chair, IRB Graduate Studies and Research Appalachian State University Boone, NC 28608	**(828) 262-2692**	**irb@appstate.edu**

Parents/guardians must be given a complete copy (or duplicate original) of the signed Informed Consent.

APPENDIX D

MCC Permission to Utilize Data

Informed Consent Waiver for the Collection of Data

Pertaining to the Older College Classmates of Concurrently Enrolled High School Students

This document pertains to the collection of data from Mitchell Community College students for the doctoral dissertation of Todd Martin. This data will be collected in the fall of 2008 and in the spring of 2009. Although concurrently enrolled high school students at Mitchell Community College will be asked to complete at least two college readiness surveys and possibly participate in focus groups, their older college-aged classmates will not be asked to do anything in response to this research project. Instead, all data related to these older students will be collected exclusively from student records. Specifically, data will be collected on:

1. the ACCUPLACER placement test scores of these older students, and
2. whether or not these older students achieve grades of C or better in the college transfer courses that they take with the concurrently enrolled high school students involved in this project.

In both cases, the purpose of collecting data will be to calculate averages for the group rather than to report on specific individuals. No identifiable information about the older classmates of concurrently enrolled high school students will be released. Furthermore, because this project will yield information on the effectiveness of concurrent enrollment programs at Mitchell Community College, the college has the potential to benefit from it. Therefore, it has been deemed unnecessary to obtain informed consent from the older college classmates of the concurrently enrolled students involved in this study. As a result, informed consent from Mitchell Community College participants and their guardians will only be obtained for the concurrently enrolled high school students.

Todd C. Martin (Primary Researcher)

Dan Manning (Dean of Student Services at Mitchell Community College)

Tim Brewer (Vice President of Instruction at Mitchell Community College)

APPENDIX E

Institutional Review Board Approval

Appalachian
STATE UNIVERSITY

Research and Graduate Studies
ASU Box 32068
Boone, NC 28608-2068
(828) 262-2130
Fax: (828) 262-2709
www.graduate.appstate.edu

TO: Dr. Barbara Bonham
Department of Educational Leadership
Mr. Todd Martin
Department of Educational Leadership

FROM: Jay Cranston, MD, Chair
Institutional Review Board

DATE: June 12, 2008

SUBJECT: Institutional Review Board
Request for Human Subjects Research

REFERENCE: *"Implementing a Model for Assessment of Student Performance in Cognitive and Non-Cognitive College Readiness Variables in Concurrent Enrollment Programs at a North Carolina community College"*

IRB Reference #08-249

Initial Approval Date June 12, 2008
End of Approval Period June 11, 2009

Your request for Review of Human Subjects Research has been approved.

OHRP Guidelines stipulate that projects may be approved for a maximum of one (1) year. During this period, you should contact this office to:

1. report any unanticipated problems involving risks to subjects or others,
2. request modification in the approved protocol,
3. request an Extension beyond the one (1) approval, and/or
4. inform the IRB of the completion of the project.

Best wishes with your research.

JWC/jdd

APPENDIX F

Interview Questions

Interview Questions

1. Concurrent enrollment can be defined as “participation in college level courses and the earning of college credits while still in high school.” As a result of this concurrent enrollment experience, what did you learn about college that you didn’t know before?
2. To what extent did this concurrent enrollment experience increase your college readiness? Please explain.
3. To what extent did this concurrent enrollment experience contribute or take away from your desire for a college education? Please explain.
4. Do you have any comments or questions that this concurrent enrollment experience has brought up?

BIOGRAPHICAL INFORMATION

Todd Clifford Martin was born in Hickory, North Carolina, on June 10, 1968. He attended local secondary schools, and graduated from Maiden High School in June 1986. The following autumn, he entered Lenoir-Rhyne College, in Hickory, North Carolina, and in June 1990 he was awarded the Bachelor of Arts degree in psychology. In the fall of 1990, he began study toward a Master of Arts degree in psychology at the University of North Carolina at Greensboro. The M.A. was awarded in June 1993. In August, 1998, Dr. Martin began study toward an Educational Specialist degree in higher education at Appalachian State University. This degree was awarded in June 2000. In July 2005, Dr. Martin was accepted into the doctoral program in Educational Leadership at Appalachian State University. He was awarded the Doctor of Education degree in May 2010.

Dr. Martin is a psychology instructor at Mitchell Community College, the setting of his dissertation. He is married to Stacy Martin, who is an elementary school teacher in Hickory, North Carolina. Dr. Martin is the proud father of Sadie Rose Martin, who was two years old at the time this biography was written.